Association

APRIL 1946 VOL. 28 · NO. 4

Some of the many advantages of Gas and Modern Gas Equipment

- Dependability
- Versatility
- Simplicity
- Minimum Capital Investment

When the operator turns on the Gas control, he knows that this modern fuel will go to work at once, evidence of its dependability.

No matter what special conditions obtain in your plant, Gas will be found the most versatile fuel. It is adaptable to any problem in heat treating—there is Gas equipment to meet any situation in the application of heat industrially.

Gas equipment is the easiest to introduce to any production system. Gas works with or without a furnace; there is no other source of heat for plant operation that can surpass this modern fuel in simplicity of equipment, yet do such a successful job.

For the benefit of the established enterprise or the new venture, it is well to know that Gas and Gas equipment require, usually, only minimum capital investment. That is because Gas equipment is modest in first cost, dependable, versatile in application, simple to utilize, economical to operate and requires no investment in stored fuel. The Representative of your local Gas Company is always available for consultation on any industrial problem requiring heat.

THE TREND IS TO GAS
FOR ALL INDUSTRIAL HEATING

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

There is a little filler item in this issue that says the only difference between a rut and a grave is in the depth. We submit that the gas industry is not digging any ruts but a firm foundation for progress. . . . Take for example President Boothby's inspiring presentation before the New England meeting of reasons why life is just beginning, for this fine old industry of ours. Its optimistic tenor is backed by the logic of forceful current events, all bearing the seeds of expanding life. . . . Or take Mr. Hulcy's exposition of the new paths being charted in a promotional way. Many innovations are contemplated to spread the gas gospel and you'll find no ruts in that quarter either. . . . Or turn to industrial fields and note such dynamic concepts as those expounded by Mr. Hess in his high-speed gas heating essay. His message calls for imagination plus technical skill—none of which attributes are associated with rut-making. . . . As a clincher, how about the development of new products such as the "fourth zone" cooker described herein? It's a testimonial of faith in the gas industry's vitality when an outside manufacturer ties his future to ours with an attractive new product. Q.E.D.

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JAMES M. BEALL, *Editor*

Life Begins—In '46

BY EVERETT J. BOOTHBY

President, American Gas Association; and Vice-President and General Manager, Washington Gas Light Co., Washington, D. C.

LOOKING back over the history of the American gas industry for a bench-mark one might select almost any of its 130 years to begin consideration of its new life. But the forces of its heritage seem to have combined with those of the present in such a way as to permit us in 1946 to foresee a future more exciting, more inviting than anything yet known.

Let us examine just the last decade. Here we find accelerated growth expressed by increased sales, outstanding war performance and unprecedented industry study and planning. Close unity of purpose and action has permitted the launching of cooperative research and promotional programs that are the envy of many other industries.

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In this ten-year period the gas refrigerator became a real recognized factor for gas sales; the "CP" range was born and took its place in glamorizing gas service; the gas water heater was improved and gas house heating, partly by reason of war experiences, became almost a "must" for every new and modernized home. Gas year round air conditioning too, became an actuality, translating the phrase "The Four . . ." to "The Five Big Jobs," while the garbage disposal unit, clothes dryer and other developments made it almost old fashioned to talk about any number limit on "The Big Jobs." Finally, the New Freedom Gas Kitchen added its luster and drew attention of other industries to the modernity of our product.

Radiant tube heating, controlled atmospheres, improved furnaces and controls and numerous other advances helped to ready the industrial gas business for its important war task, which task was assumed with a minimum of fanfare and performed with a maximum of efficiency as one of our contributions to victory. The combined industrial and commercial gas load doubled in volume in the past ten years and the diversity of applications increased to a point where some gas B.t.u.'s now go into practically every kind of manufactured article used by the American public. Together with expansion in the number of domestic customers to over twenty million, these industrial and commercial gains make it an unassailable truth that gas *is* the universal fuel.

We stand here early in the new year with a proven record of accomplishment, endorsed by an enviable degree of public acceptance—an excellent foundation on which to build. We have a plan and a resolve for action. The tools for action include a great laboratory at Cleveland and another at Los Angeles, appliance manufacturers keyed up with a determination to perform, a national organization and strong coordinated regional organizations, a unity of purpose and thinking that cannot but overcome all obstacles.

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In entering such a new period of development, let us be mindful of our responsibilities as well as our potentialities. Both must be evaluated and boldly assumed. Because the gas industry has become a universal and essential industry whose performance affects the lives, happiness and progress of millions, our watch word must be "service." Service is a personalized sort of thing that can be carried out only between server and served. The server in our case is the local gas company.

The first great responsibility of the gas industry, therefore, is to see that every individual in the industry not only believes firmly in the doctrine of service but also faithfully practices it. Our training courses, now available nationally and our industry committee objectives and codes can serve a useful purpose by making every employee a better public

Presented at New England Gas Association Annual Business Conference, Hotel Statler, Boston, Mass., March 21-22, 1946.

● Opposite: A typical derrick floor operation of a gas and oil well being drilled in the Carthage Field in Panola County, Texas. Photographed by J. E. Hampson of the Arkansas Natural Gas Corporation, Shreveport, Louisiana

servant. To that must be added the responsible part taken by members of local management and through them local employees in making every effort to render at all times the best possible service.

The millions dependent upon us for service have an investment of several billions of dollars in gas-consuming appliances estimated to be larger than the investment of the utilities. The industry has an obligation to make sure that this large consumer investment pays dividends. This means that we must be not only ever on the alert to improve the quality and performance of these appliances, but also to search for new appliances and new uses to supplement the present ones, thereby advancing customer satisfaction. In the realm of industry this means offering every possible aid to larger production of goods which can be sold at lower and lower prices.

Gas Industry Responsibility

By reason of the important position of the gas industry there is a heavy responsibility placed on its leaders to devote their time, energy and talents toward the end of holding aloft the torch of true democracy. We are all irked by petty disturbances and are often disturbed by government regulation and restrictions and by other road blocks to what we think is progress. All too often we spend time and energy condemning these things instead of exerting our efforts to ferret out and correct underlying causes.

We as an industry can speak from experience about many of the problems of the day. We know what regulation is, and public scrutiny, competition, and monopoly, and something of public ownership and socialistic dogma. We know what it means to meet payrolls and to sell securities and to answer arguments of opposing groups.

Obstructionism is inevitable in our democratic processes. There is one way to meet it, through something on which we have already touched, something which in a very real sense is the essence of democracy; namely, service! We need not be vulnerable if we give excellent service at fair rates. Frequently, of course, this alone does not insure good public relations—the public must be kept informed. If we are doing a good job we can, and should, expose obstructions—real, not fancied ones. In so doing, we are meeting our responsibility for the progress of our people toward better living. That in itself is fulfilling a high concept of service.

It is inspiring to contemplate the various pathways to progress that might be opened up by our research program about which you have heard so much. While our expectations are naturally high we must not permit our hopes to become too sanguine. Research is a slow process, sometimes laborious and often fruitless. We have not gotten too early a start considering the long years of our industry's history. We are not extravagant in the amount of the money contributed nor profligate in its spending. Much plowing and preparation of the ground needs to be done. The impracticability or improbability of many ideas must be established. But new ideas generate new ideas, and one discovery may open the way to countless others. The potentialities are great.

New things are beginning to take shape as a result of the program, but many of them evolve so gradually into finished products and processes that we might not recognize them. For example, we seldom think of the contribution made by the Association's Testing Laboratories and their Domestic Gas Research work over the past twenty years. But if a modern "CP" range were placed beside the best 1926 vintage and a list made of all improvements in performance, appearance and economy, the results would be startling and I am sure that we should all gain new respect for research such as reflected through Laboratories' activities.

Research opens a definite road to opportunity both for service and for profit. Our industry's research should, however, be just the beginning. Already we are seeing our industry researchers collaborating with others for the common good and to eliminate duplication. Undoubtedly there is much going on in our local company laboratories, in college and other laboratories, that can be coordinated, strengthened, encouraged and woven into our industry program. Ferreting out, appraising and stimulating these contemporary endeavors and effecting greater unification among them is one of the important jobs of our coordinating staff and committees.

The industry's promotional program, which will be authoritatively discussed on this program by the Chairman of the American Gas Association's Promotional Committee, D. A. Hulcy, offers a real opportunity. The gas companies of New England not only responded almost unanimously to the appeal for funds but are ably represented on the committees carrying out the program and will, I feel sure, adapt to their individual programs the best that is offered in the overall promotional project. This kind of cooperation is extremely encouraging and should be mutually profitable.

Strong Regional Associations

Your regional organization and our national one are two strong groups, well conceived, carefully developed and expertly administered, each serving a definite purpose and serving it well. I know that I reflect the views of all national leaders when I say that it is to the interest of the gas industry of the United States to have a live, strong New England Gas Association. While we are gathered here today and tomorrow contemplating the problems peculiar to New England, clear across the country at its opposite corner another vital unit in our industry is meeting. At Galveston, Texas, the Southern Gas Association is holding its annual conference on these same days.

These two *(Continued on page 176)*

Orchid for A. G. A.

IN a letter accompanying his check for A. G. A. membership for 1946, C. G. Simpson, manager, personnel department, The Philadelphia Gas Works Company, wrote as follows:

"Prior to the war, I was active in, and held office in, several trade and professional organizations, and I would like you to know that during my 3½ years of service in the Army, the A. G. A. more than any organization, made me feel that I was still a member, and still in touch with the organization. Under your policy I held my membership at no cost during the war, and at no time did I fail to receive the A. G. A. MONTHLY, or other material that I would have received had I not been in the service.

"I thank you and compliment you."

Gas Sales Promotion Program

Five-point program of action adopted for A. G. A. national sales promotion campaign and outline of activities now under way or contemplated by newly-organized bureau

BY D. A. HULCY

Chairman, Promotional Committee, American Gas Association; and President, Lone Star Gas Company, Dallas, Texas

D. A. Hulcy

A YEAR ago when this great Association held its annual business conference the lines of battle were drawing tight around our enemies and the promise of victory was real.

Today that promise has been fulfilled and we meet to discuss and put into action the plans that were created by the industry, operating through the American Gas Association, for the comfort, convenience, economy and better living of postwar America.

Background for Sales Plans

These plans are not products of the crystal ball nor are they expressions of wishful thinking. They are based on research—scientific, thorough and broad gauged. It is a tribute to the vision and determination of the men in the gas industry that back in 1943 they undertook a program of painstaking research designed to explore every problem that would confront the gas industry in the postwar period and to provide the key to the solution of those problems.

The Postwar Planning Committee published four significant reports. While different in theme, these studies led to but one conclusion—that the extent and variety of our postwar competition was so formidable that unless the gas industry entered upon an aggressive campaign to retain present loads and capture and create new ones the question before us would not be "How to run our business" but rather "Will we have a business to run?"

Action came fast. It was clearly evident from the postwar survey that we had to enlarge our technical research, increase our national advertising and create a new and potent force—a Promotional Bureau.

A special Committee on Research and Promotion immediately set about raising the money, a supplementary fund of a million dollars a year for a three-year period. Your response was magnificent. The first year's budget was raised in 90 days. I think this presents an example of determination, vision and unity equaled by few groups in any industry or trade.

This special fund provided a budget of $200,000 for the creation of a Promotional Bureau and the operation of a nation-wide promotional campaign. It is important to remember that these funds were ear-marked for promotional use only and that while the Promotional Committee determines its own programs, the control of the money is in the hands of the men who raised it, the Research and Promotional Committee acting as trustee for your contributions.

I have indicated the steps that led to the creation of the Promotional Committee so that you may become familiar with its background. This presentation is in the nature of a progress report of that committee, the first to be made concerning its activities.

The Promotional Committee came into being about nine months ago. It represents all interests in the Association and every region of the country. The vice-chairman of the committee comes from your own association. He is R. A. Malony, sales manager and director of personnel of the Bridgeport Gas Light Company in Bridgeport, Connecticut, and New England is again represented on the committee by R. J. Rutherford, vice-president, Worcester Gas Light Company and J. J. Quinn, general sales manager, Boston Consolidated Gas Company, and chairman of the Residential Gas Section of the American Gas Association and chairman of the National Advertising Copy Committee.

The Promotional Committee, meeting for the first time last July adopted a five-point program of action and provided for the organization of a Promotional Bureau to put it into effect. Briefly, the plan provides that the Bureau shall:

1. Coordinate and implement the promotional activities of the Association, the various branches of the gas industry and related industries, including the manufacturers and dealers. It will weld the promotional programs of these various groups into comprehensive, well-integrated, hard-hitting campaigns.
2. Initiate, propose to or prepare for sections and committees of the Association promotional plans for advertising, publicity and sales promotion.
3. Be available to all sections and committees in an advisory and coordinating capacity.
4. Foster and guide new product development; and
5. Promote market research and surveys.

Promotional Bureau Objectives

The Bureau will be a flexible, versatile unit of the Association. It will not duplicate the work of any other group nor will it intrude upon the activities of the regularly constituted committees and sections and their staff representatives. It will work with and for every section of the industry and among the manufacturers. Three words tell the story of its work—Create, Stimulate and Coordinate. It seeks to convert the well-worn term "Public *Acceptance* of Gas" to "Public *Demand* for Gas."

Shortly after the committee had been organized, H. Carl Wolf became managing director of the Association, bringing with him a rich background of promotional experience and an outstanding record of performance in that field. Mr. Wolf will assume executive responsibility for the operation of the new Pro-

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motional Bureau and its programs, thereby giving it valuable support at the top.

The next step was to obtain a competent director for the Bureau. After interviewing and screening many able men, the committee selected Colonel John H. White, Jr. from Rochester, New York, where he had established an outstanding sales promotion record at the Rochester Gas and Electric Corporation. A West Point graduate with wide experience in the promotional fields of business and industry, Colonel White is competent, energetic, resourceful and cooperative. I know you will enjoy working with him.

The staff of the Promotional Bureau, which has been in operation for less than three months, has been enlarged recently to provide an assistant to Colonel White. He is Edward Drew, formerly in charge of public relations and promotion for the American Bankers Association. A man qualified to write bulletins, booklets and to handle exhibits will soon be employed.

So much for the organizational structure of the Promotional Committee and the Promotional Bureau. Now for a sketch of some of the promotional activities of the American Gas Association under the enlarged, aggressive Promotion and Research Program.

1. Merchandising at Grass Roots

A sales promotion program becomes most effective when it is applied at the point of sale. Recognizing this the Residential Gas Section of the Association last Fall took a greatly augmented all-gas merchandising program across the nation to more than 3,000 representatives of utility companies, appliance manufacturers and dealers in 31 cities.

You will recall those splendid meetings, one having been held here in Boston and another in Hartford, Connecticut. They featured a comprehensive merchandising program sponsored by the Surface Combustion Corporation of Toledo, Ohio, which concentrated on the promotion of all the major residential uses of gas. It included the Home Planning Bureau as an effective device for carrying this program into the field of new home planning and home modernization. Bureaus have already been established by many companies, and information already received at Association Headquarters shows a real interest and appreciation for this service by the people served.

The programs of these meetings were diversified and included other merchandising plans. Among them were Servel's All-Gas Kitchen presented by representatives of Servel and the American Gas Association Refrigeration Committee; a plan for increasing sales of automatic gas water heaters by representatives of the Ruud Manufacturing Company; and dramatized versions of employee instruction and sales training courses. The "CP" program was also discussed by representatives of the "CP" Range Division of the Gas Appliance Manufacturers Association and the Domestic Range Committee, and a preview given of the Reference Manual of Modern Gas Service, which I shall mention in a moment.

These meetings were a brilliant success and represented a high degree of coordination and cooperation between the Association and progressive manufacturers. They were conducted under the direct sponsorship of the Residential Gas Section, the financing being provided by the Promotional Committee.

2. Modernized Home Building

The building of millions of new homes and the modernization of mil-

Gas Exhibit Popular at Home Builders' Show

RECORD crowds representing all sections of the country greeted the first postwar exhibit of the National Association of Home Builders in Chicago, February 25-28. Many of the postwar products, which up to this time have been kept under wraps, were being shown for the first time to builders and tradesmen.

The New Freedom Gas Kitchen Bureau was prominently represented and, according to many of the builders in attendance, was one of the outstanding features of the show. The display—modernistic in design, brightly illuminated the smartly-colored—featured a number of scale models of New Freedom Gas Kitchens as well as several pieces of original art work showing the glamorous new kitchens, which the gas industry is currently featuring.

Of particular interest to the builders and architects was the display of the first press proof of the "Reference Manual of Modern Gas Service" which will soon be available for general distribution. Several thousand requests were registered for further information regarding this manual, indicating the widespread interest. According to comments made to attendants, this constitutes a valuable contribution to the art of home planning.

The attendants, all kitchen planning consultants, were Mrs. Jean Harrison of the Minneapolis Gas Light Co., Mrs. Florence Woodward, Rochester Gas and Electric Corp., Mary Huck, The Ohio Fuel Gas Co., and Evelyn Kirkpatrick, Boston Consolidated Gas Company.

The display was planned by H. Vinton Potter, director of the New Freedom Gas Kitchen Bureau, and was sponsored by the A. G. A. Promotional Bureau, John H. White, Jr., director.

John H. White, Jr. (left), director, A. G. A. Promotional Bureau, and H. Vinton Potter, director, New Freedom Gas Kitchen Bureau, pose with kitchen planning consultants at the Home Show gas exhibit. The girls in the picture are, left to right: Mrs. Florence Woodward, Evelyn Kirkpatrick, Mary Huck, and Mrs. Jean Harrison

Servel's unified gas kitchen exhibit at the Home Builders' Show gets a thorough inspection from the gas industry's home consultants

Features of the Roberts and Mander Stove Company's model kitchen exhibit win the approval of Mrs. Florence Woodward and Mary Huck

lions of others within the next few years provide an opportunity for the gas industry that will not be repeated within our generation. Adequate provision for the installation of gas appliances must be made in a substantial percentage of this new construction to assure profitable loads in the years ahead. The time to do it is before the plans leave the drawing board or the contract is signed or the first nail driven.

This tremendous building movement finds the gas industry well prepared. The Reference Manual of Modern Gas Service is now being redesigned by the Residential Gas Section so that this splendid material will have a promotional slant with an appeal to the eye as well as to the mind.

When the book appears it will be backed by a fast-moving promotional campaign designed to place it in the hands of architects, builders, bankers and others in financial institutions, plumbers, dealers and everyone else who will have a part in designing and building the Home of Tomorrow.

3. New Freedom Gas Kitchen

Few merchandising programs have captured the imagination of the American housewife as has the New Freedom Gas Kitchen. It was a feature of the National Association of Home Builders and Architects Show in Chicago last month and will be displayed at many other national exhibitions.

Much of the credit for the success of this program is due to the imagination, energy and ability of H. Vinton Potter, director of the program, and the members of his committee, with high praise due the National Advertising Committee and the copy group. Mr. Potter will soon have an assistant to help meet the increased demands of the membership.

Provision has been made for increasing the activity in this program. Upon recommendation of the Promotional Committee a fund of $41,500 has also been authorized for use in promoting the New Freedom Gas Kitchen during the present Association year. A request has been made that the Gas Appliance Manufacturers Association participate in the underwriting of this effort which benefits its members as well as utilities.

New Freedom Gas Kitchen director, H. V. Potter, gets home planning pointers from consultants Mrs. Florence Woodward and Mrs. Jean Harrison, who attended gas industry exhibit at Home Builders' Show

Another view of the gas industry's exhibition at the Home Builders' Show. Note model kitchens, houses, Architects' Manual and attractive New Freedom Gas Kitchen photographs

Perhaps the most important promotion planned for this program is a consumer booklet on the New Freedom Gas Kitchen. The National Advertising Committee wrote and designed this colorful, attractive and sales-jammed 24-page booklet. It will be made available to you and the other members of the industry within a short time in quantity lots at the rate of 10 cents each. This barely covers cost. Already 200,000 copies have been ordered by alert utilities for distribution to their customers and prospects. I urge you to place your order early with the Promotional Bureau of the American Gas Association so that you may obtain your share of the first printing and be in a position to cash in on the Kitchen's national advertising that is now commanding the interest of Mrs. America in every section of the nation.

4. Automatic Gas Water Heater

This effective load builder and great boon to the health, beauty and cleanliness of the American home is included in the promotional plans that have already been approved and are under way. Requests from educational institutions, utilities and manufacturers for material on the Home Laundry will be met by a special publication featuring this home unit. This publication, however, will be but one chapter of a more comprehensive manual which will appear later and which will cover all the uses of hot water in the home.

The laundry, or the New Freedom Laundry if you choose, will be the theme of the Association's exhibit at the important 1946 Home Comfort Exposition to be held in Atlantic City in May, sponsored by the National Association of Master Plumbers of the United States.

The Promotional Bureau is now completing a national survey of effective sales and rental plans used by utilities in promoting the automatic gas water heater. These findings, after they have been reviewed by the Gas Water Heating Committee, will be published and distributed.

5. Commercial Cooking

And the commercial and industrial side of promotion has not been overlooked. It is evident that gas is going to feel keen competition from other fuels, particularly electricity, in those areas where heretofore we have enjoyed almost a 100 per cent saturation. Our plan is to bring the story of the advantage of gas in commercial cooking to the members of hotel and restaurant associations, purchasing organizations, architects and builders who specialize in hotel, club, hospital and restaurant kitchens, and all others who are interested in any way in the mass preparation of food.

The Promotional Bureau will employ a qualified man to head this work. He will devote his full time to promoting the activities of the Industrial and Commercial Gas Section and will work in close cooperation with the Food Service Equipment Committee of that section and with the Hotel, Restaurant and Commercial Gas Equipment Division of the Gas Appliance Manufacturers Association.

6. Ranges, Refrigeration, Heating and Air Conditioning and Dealer Cooperation

Promotional programs for each of these major factors in our industry are now being formulated. The committees in charge of each particular activity met in Chicago last week and their recommendations were discussed with Colonel White, Director of Promotion, who attended the meetings. It is too early to reveal the nature of these particular campaigns but I can assure you they will be vigorous, industry-wide and effective.

7. Motion Pictures

The Promotional Bureau is now making a survey of motion pictures produced by member companies and allied manufacturers. Those that are available for use by other companies will be catalogued so that new material will be available for your educational and promotional work among service groups, trade groups, women's organizations, schools and other audiences.

Too, it is making a careful study of the production of new pictures, sound films, some perhaps in color, which would be available to you for local use.

I have attempted to give you the high points in this tremendous coordinated effort as it has developed so far. Further important aids for our industry are to be developed. I believe we need to do a great deal of work to assist the "end man" in his selling of gas appliances. I mean the salesman who is right out on the firing line and has to get the name on the contract, and especially the dealers' salesmen. I think we need to place in his hands the tools and the ammunition to assist him in meeting competition.

Salesman Needs Ammunition

Many of the activities we have talked about here are in the nature of softening up the situation to enable the salesman to attack more successfully but we must not forget that the salesman, like the foot soldier, needs weapons and ammunition so he can go in and capture the order. We must not only present the beautiful modern gas kitchen, but we must enable the salesman to convince the customer why the gas range needs to be in that kitchen instead of the electric range.

Many salesmen tell me that we should have a first-class up-to-date range manual which will prove, among other things, why gas ranges are better than electric. We must place in the salesman's mind the conviction that the gas range is *the* thing to sell and that it will do a far better job than any other type of range. Our excellent research data must be put in usable *sales* form if we are going to round out a complete promotional activity.

It may be that such a range manual would have to be written from two standpoints, *(Continued on page 176)*

Hiroshima

●A friend of ours is back from inspecting what's left of Hiroshima. He tells of seeing a municipal gas tank which, for war purposes, had been painted a dull black. The heat of the bomb explosion baked the paint to enamel. On the side of the tank were etched the clear outlines of a tall building. After the atomic flash, the building had stood up for a split second, long enough to print its shadow on the tank. Then it had collapsed in the blast of air that followed. The word Hiroshima, by the way, is pronounced according to our traveler, HeROSHema, like a full-bodied, man-sized sneeze, and not HEroSHEma, as ignoramuses and the dictionary believe.

—*New York Times (Magazine Section)*

Fig. 1

High-Speed Gas Heating

Only by combining timing, handling and heating into engineered production units can gas reap high-speed harvest

BY FREDERIC O. HESS

Selas Corporation of America
Philadelphia, Pa.

Frederic O. Hess

HIGH-SPEED Direct Gas Heating—what is meant by that phrase? I have heard it said that high-speed heating is nothing new. It is just a fancy expression for long known facts, or that it has to be proven in practice as to its value and its benefits, if any. That it is uneconomical because of waste heat and lack of heat exchange.

There is, in the American language, a very appropriate expression which I would like to make use of in this connection and in this talk; namely: "It all depends on the way you look at it." Unquestionably speed is often uneconomical. Actually the automobile is uneconomical from a fuel efficiency standpoint in comparison to the horse and buggy; in fact one can argue quite forcefully that the automobile has no economical justification for mankind, and that the most efficient way of transportation is still two-legged manpower. While we can argue about the economical merits we are going ahead using airplanes, and pushing for still higher speeds, and now we are almost frantically building rockets and jets, still less economical power plants as far as fuel efficiency is concerned. But these all add up to what we term technological progress, and so does high-speed heating. Speed is an inseparable companion of progress.

There is no accurate, scientific definition of high-speed heating. The term in general implies that "conventional" heating rates are being exceeded, and that the heat source is at considerably higher temperature than the final temperature of the object to be heated. To be specific, high-speed heating includes such operations as bringing a 1" diameter steel bar from cold to hardening temperature in 90 seconds, or even faster; and to forging temperature in two minutes or better; to bring a strip of steel 20/1000" thick from room temperature to annealing temperature in approximately one second; and to apply similar heating rates to other materials, such as copper, brass or even non-metallic products, such as paper, etc.

The term high-speed heating also includes heat input rates of such intensity that heating effects can be localized and make possible such heat-treating operations as surface hardening or surface drawing; or localized heating as required in brazing or local annealing, without materially affecting other parts of the work. This means of course that heat has to be applied and absorbed faster than the metal or material can and will conduct heat away; so much so that a definite heat pattern is obtained.

The practical importance of this phase of high-speed heating is clear—heat treat only where required. The results are manifold. One is—less distortion of parts and therefore the heat treatment can be next to the last, or actually the last operation in production. Localized heat treatment furthermore retains the desirable characteristics in other parts. For instance: in a metal part a soft ductile core can be retained with a hardened surface. Typical examples are bearing shafts, teeth of gears and similar structures. Entirely different materials and processes of manufacture are made possible. For instance: localized hardening helped to promote the production of cast cam shafts for automobiles, in contrast to the forged steel shaft. The very principle of the operation necessitates that it be done fast and therefore scale or decarb are of little practical consequence, and the process lends itself to high production methods. The speed of the operation brings about some additional benefits resulting from small grain sizes and greater hardness,

Presented at American Gas Association Sales Conference on Industrial and Commercial Gas, Toledo, Ohio, March 29 and 30, 1946.

Fig. 2

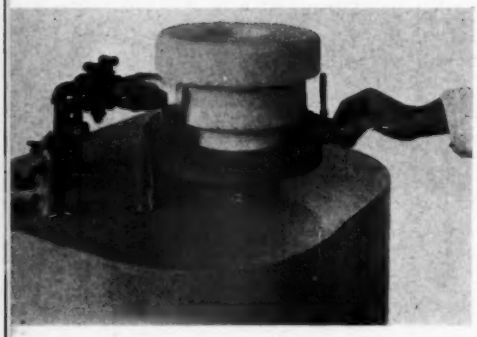


Fig. 3

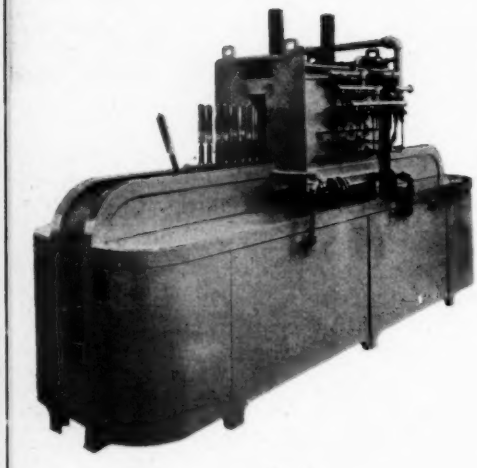
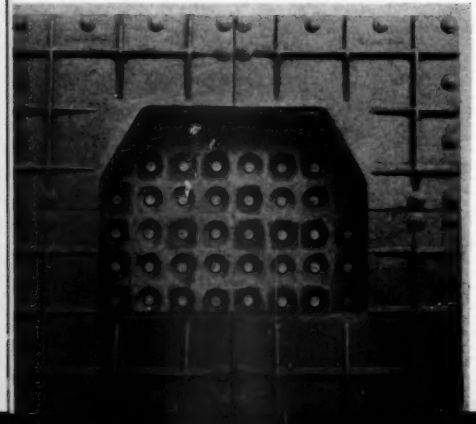


Fig. 4

Fig. 5



and therefore improved performance characteristics.

Beyond doubt surface or local heat treatment has been established as a process and as a valuable part of modern production methods; in fact it has become necessary for our technical products and our performance requirements. But again "it all depends on the way you look at it." Before the gradual evolution of the direct surface heat treatment many of the same parts were heat-treated by other surface treatments, such as carburizing, nitriding, and we merely switched gas load from one type of equipment to another. However there are two other methods of effecting local heat treatment, which are actively promoted in this field, and we might as well recognize them and analyze our respective position to help us at least hold our own.

One method uses oxy-acetylene, which has the advantage of higher flame temperatures and therefore faster heating rates, permitting shorter heating times, and also thinner skins of hardness. The hazards are a rather sensitive adjustment and the possibility of surface damage due to overheating and actual burning. The equipment however is relatively simple. Usually special torches are involved, but almost everyone is familiar with and now uses oxy-acetylene in industrial production work. Fuel, therefore, is available without great investments by the manufacturer, but the operating costs are higher because of fuel cost premium.

Induction Heating Lure

The other method is of course induction heating with its lure of push button operation, of quietness, of speed, and of the most modern of heating developments. Those of you who attended the Cleveland Metals Congress in February saw a great many operating exhibits of induction equipment; some single station units and some continuous production units. Even though there were a large number of induction exhibits, the largest producers of such equipment were not even represented. Here is substantial competition and formidable performance. The initial cost is relatively high, although it is steadily coming down, and the operating cost is high. But the argument goes—there are no fumes, no hot gases, equipment provides for a clean shop, the utmost comfort for the operator, and it is modern.

We all know we cannot eliminate gases from gas-burning equipment, and therefore our sales emphasis must be operating cost, investment cost, or specifically the cost per piece heat-treated, derived from depreciation of equipment, from fuel cost, power cost, maintenance or upkeep. The cost per piece is the most important factor. In our opinion and experience there is at least one more element to consider; namely: appearance and sales appeal. We should not lightly disregard that point.

Depends on Viewpoint

Electric equipment is presented as modern, and we have to counteract this public impression. Again, "it all depends on the way you look at it." And how do we look at it? How many of you buy a car actually on mechanical features, and on motor design and details of construction? How many on gas mileage? I venture to say that the main considerations are overall reputation of performance, investment cost and appearance. Sure the industrial purchaser is cost-minded, and the production engineer selects equipment on performance, but the operator also has to be sold, and industrial management of today is very conscious of the role, the satisfaction and the comfort of the operator. Electric induction equipment is neat, streamlined and dressed up for appeal and appearance. We believe, and advocate that gas equipment can and must be the same, and I would like to show by illustrations some efforts in that direction. This also affords the opportunity to give you some comparable figures:

Figure 1 shows a production machine for the hardening of starter ring gears. The application requires that the teeth are being hardened while the inside of the gear remains soft. The physical dimensions of the machine are—7 ft. in diameter; it incorporates 5 stations; 2 heating stations, 2 quenching stations and one for loading. Quenching is performed in oil, and the total heating time per gear is 24 seconds. The total operating cost, at a production rate of 180 gears/per hour is 1700 cu.ft. of natural gas per hour, or a fuel cost of approximately 4/10¢ per gear.

Induction heating equipment having a similar production per hour at 1¢ per K.W. has an electric cost of $1.00 per hour or approximately .55¢ per gear. The investment for the electric equipment is $26,000 and the gas unit was sold for $16,000. Assum-

ing an amortization in one year at a production rate of 300,000 gears per year, the difference in investment between gas and electric equipment amounts to 3.3¢ per gear. With a minor modification of the combustion equipment in the gas unit, production can be doubled for only a slight increase in investment and in fuel consumption. Therefore the operating cost and investment cost ratio of electric versus gas equipment will be further changed in favor of gas.

Figure 2 pictures an automatic machine for the hardening and drawing of ball peen Hammers, capable of producing 240 sixteen oz. hammers per hour. On the left dial the hammers are being hardened, and on the right dial they are being drawn. Since both dials operate on the same shaft you will notice the hardening and drawing time is practically identical. The fuel consumption for both operations amounts to 600 cu.ft. of natural gas per hr., or at 5¢ per therm to .12¢ per hammer. On a one year amortization basis the equipment can be written off at the rate of ¾¢ per hammer.

Figure 3. This unit was originally designed for the heating of parachute snap hooks for forging, but since the end of the war has been applied to heat a multiplicity of other parts. The interesting feature about this simple little heating machine is that it had a production rate of 1000 snap hooks per hour, at a fuel cost for heating with manufactured gas of one-hundredth of one-cent. At the time this machine was placed in production the induction people offered a unit for the same operation which had a capacity of 514 snap hooks per hour, which was nationally-advertised because of its high production rate.

Figure 4. Large collapsible tubes made of aluminum require an anneal in order to regain flexibility after extrusion. This continuous annealing machine has a productive capacity of 2000 2″ x 10″ collapsible tubes per hour .006″ wall, at a gas consumption of 150 cu.ft./hour. The total time for heating and effecting a complete anneal is 15 seconds.

Figure 5 illustrates an interesting high-speed heating operation as applied to brazing. This unit was designed to braze up to 300 tube ends into tube sheets all at one time, with the specification that all joints had to be tight because no repair could be made. This particular unit has brazed more than 1000 of such tube sheets without burner replacement.

Figure 6 is a sample of a streamlined machine designed for the hardening of 2 nibs on a cartridge clip. These clips are made of 10 carbon steel, and by rapidly heating and quenching the nibs only the life of the cartridge clip has been quadrupled. Production rate—120 per minute. Heating time approximately 5 seconds.

Figure 7 is a drum-type machine, also for hardening nibs for the carbine clip, at a production rate of 60 per minute.

Figure 8. This dial type heating machine is designed for annealing the ends of brass tubing up to 2″ diameter 2½″—5″ from each end. The machine allows adjustment to take tubes from 12″-50″ in length. The production rate is 1200 per hour. Total heating time 30 seconds for .045 wall thickness tubing.

Figure 9 shows an automatic machine of dual purpose. Radio tube bases require sealing of the contact pins to the metal base with pyrex glass. In this small unit 6 pyrex tubes on each base are brought to a melting temperature of approximately 1100° C. to provide a glass seal and insulating properties between contact pins and metal base, and subsequently the assembly has to be cooled to 500° C. before discharge. The total time cycle is 4½ minutes. The production is 350 per hour.

Certainly in many cases a few burner assemblies and some home-made gadgets will perform a similar operation and maybe hold the particular job for gas. But let us look again and see whether this might not be short-sighted. The Army and Navy trained thousands of men in electronics, most of whom are capable of assembling an electronic heating unit, and therefore on a broad national scale can do some real gadgeteering.

No Gadgeteering Competition

There are no such government trainees for the gas companies on combustion engineering. On the basis of gadgeteering we are simply not competitive. Fortunately for the gas industry the electric industry has not worked and has not grown on that basis, and the indications are they are still inclined to sell complete equipment, and they too experience the necessity for mechanization. The gas industry might well and deliberately take a similar position because only then will it be possible to establish a production equipment and performance reputation which is impressive and effective as a sales tool.

With high-speed heating goes accurate timing, and therefore automatic handling. Only by successfully combining these functions—timing, handling and heating—into engineered production units can we take full advantage of the high-speed heating possibilities. Then only will we satisfy manpower, production and product requirements in the forging industry, steel, brass and aluminum mill, in the continuous processes, the heat-treating requirements be-

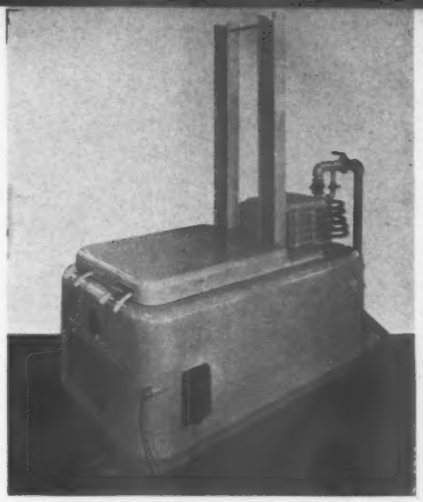


Fig. 6

Fig. 7

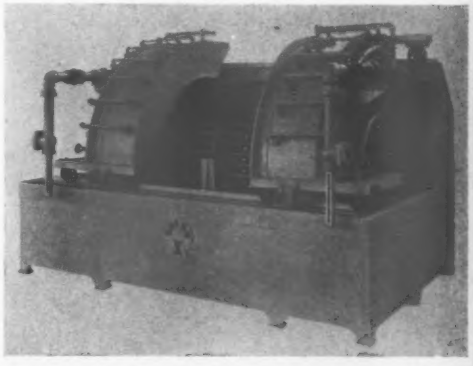
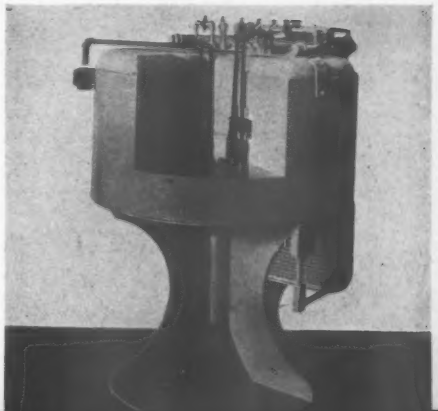


Fig. 8

Fig. 9



tween operations in the mill as well as in the production plant.

To accomplish this successfully we need, beyond the technical skill, one important trait—imagination. Recently we have had requests from some large gas companies for information about some of the high-speed heating installations. But—"don't tell us about strip or rod heating, we have no steel mill in our territory. Don't tell us about hammer hardening, we have no hammer forging plant in our district." That is the negative of imagination. That indicates a complete failure to even try to comprehend and appreciate the need and the development of new gas outlets.

The gas industry requires a better understanding and a better analysis of gas applications and potentials, and of the possibilities of high-speed gas heating. The question is not—how has it been done, but—how can it be done best? There may be no strip mill in the territory—but very likely there is a printing plant there, and from the standpoint of a heat application what is the difference between a strip of steel and a web of paper? The application of high-speed heating to a printed web, for the purpose of drying the printing ink on the surface of the paper, is almost directly comparable to the fusion of tin on the surface of electrolytic tin plate. The application of gas heat to the printing industry has revolutionized printing and has made possible today's news magazines.

This development of ink drying on the press started in a small way only a few short years ago. It was first applied to the fastest rotary magazine presses then available operating at a speed of 350 ft. per min.—a speed which is today considered inconsistent with requirements. The development has progressed so fast and grown to such importance that at this moment the entire capacity of the printing press manufacturers in the U. S. is sold out until about 1950. This in spite of the fact that new printing presses are being built by organizations which never produced similar equipment. It has so profoundly upset the printing and publishing industries that it affects everybody's life, as will be appreciated if you recognize the importance of such magazines as "Life," "Saturday Evening Post," "Time" on our national policies and reactions.

You see—"It all depends on the way you look at it."

Propane Plant Built

Consolidated Edison Company of New York, Inc., has nearly completed the propane or liquefied petroleum gas plant which is to serve as an adjunct to the company's Hunts Point plant in the lower Bronx. Shown here are some of the fourteen 25,000 gallon storage tanks. The installation will be used in periods of peak demands

American Standards Program Strengthened Through Agreement with Wallace

ACCEPTANCE by the American Standards Association of the proposal of Henry A. Wallace, Secretary of Commerce, to return to private enterprise the function of determining industrial and consumer standards was announced March 10 by the association's president, Henry B. Bryans, executive vice-president, Philadelphia Electric Company.

Henry B. Bryans

This is the last of a series of steps toward this goal—which the Federal government set in January, 1945, when Jesse H. Jones, then Secretary of Commerce, appointed a policy committee on standards, headed by Charles E. Wilson, president of General Electric Co., and composed of other business leaders and industrialists.

In a recent letter to Mr. Wilson, Secretary Wallace accepted most of the committee's recommendations. He characterized the voluntary negotiation and publication of standards through private initiative as "eminently desirable."

In accepting Mr. Wallace's proposals for the A. S. A., Mr. Bryans wrote: "Your belief in the ability of private enterprise to demonstrate its effectiveness through voluntary action lends great significance to the responsibility which the American Standards Association and its affiliated bodies are accepting. We have a record of successful operation in the field of industrial self-regulation. We feel that the arrangements suggested by the Department of Commerce have opened the way for a new concept in the relationship between government and industry."

Mr. Bryans announced a number of steps taken in strengthening the A. S. A. along the lines of the policy committee's recommendations. Through a change in its constitution, the A. S. A. has broadened the scope of its work so that it may deal with any standards or standardization project deserving national recognition, whether in engineering, consumer goods, or in other fields.

At a press conference held to elaborate on Mr. Bryans's statement and to review the history of the American Standards Association, Howard Coonley, chairman of its executive committee, said that the staff of the association would be increased materially and that its budget would be raised from approximately $350,000 a year to $500,000. This cost is prorated among participating organizations on a quid pro quo basis, Mr. Coonley explained. There are at present ninety-four participating national groups including the American Gas Association.

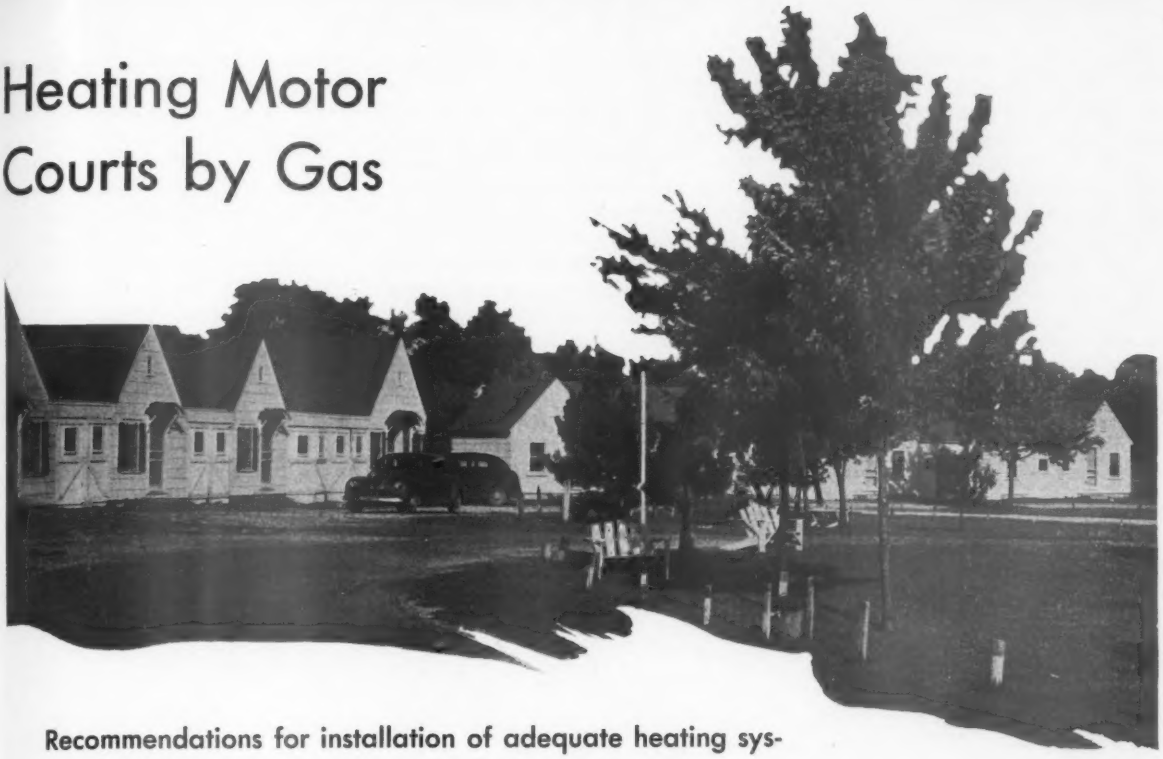
U. S. Soldiers Complete French Gas Course

AT the request of the educational department of the United States Army, the Union Syndicale De L'Industrie Du Gas En France (French Gas Association) has organized a course on city gas for U. S. soldiers in that area. To date, five soldiers have completed the course which includes a study of manufactured gas operation and treatment of by-products.

A great variety of problems was covered and especially those which concerned coke, oil-gas, natural gas, benzol and electricity in connection with the European markets for combustibles and energy in the postwar period. Visits of interest were made by the students to the more important gas works in the Parisian area and to industries using gas.

Those completing the three-week course were: Raymond Stasiak, College Park, Md.; Edward R. Smith, Atlanta, Ga.; James Eddinger, Hellertown, Pa.; George Kaplan, New York City; and Alfred H. Penovi, Sandy Hook, Conn.

Heating Motor Courts by Gas



Recommendations for installation of adequate heating systems in the thousands of motor courts spanning the country

BY CARL H. DEAN

Oklahoma Natural Gas Co., Tulsa, Okla.

ANY writer who wants to have a subject with room to move around therein is welcome to take a whirl with this one. This is a three-point subject with each point providing material for a library. Consider heating with the various requirements encountered from Maine to California, from Miami to Minneapolis. And then the motor court itself; it may be a row of shacks or a swanky air-conditioned "Motel" or any of the possible variations between these two extremes. The only constant in the subject is natural gas which has variations in price, pressures and heat content but through it all remains the cleanest, safest, and at the same time most versatile fuel in existence.

Frequently the heating of the motor court is an afterthought instead of a well-planned carefully designed system. Comfort, convenience and safety being the reasons for the motor courts' existence, the heating assumes a place of importance as great as sanitation which receives so much attention from all interested authorities. We are not concerned so much with the architect-designed and supervised establishment as we are with the thousands of courts which, like "Topsy," just grew. However, even the best designer at times looses sight of the fact that the motor court is by nature a public utility.

The true measure of successful operation of a public utility is not the day-by-day service rendered but the response to peak demands and the stresses of emergencies. So the heating system of the motor court must be as simple as possible. It must not be loaded with gadgets such as blowers, pumps and controls subject to power failures due to wind, freezing rain or blizzards. At such times the services of the motor court are in greatest demand. There is always a shortage of help during this period consequently the failure of an automatic stoker, oil burner motor or heat distribution equipment is tragic. A heating system should not be burdened with electric devices unless the overall current requirements of the establishment warrant the installation of a generating power plant. Gas is the only fuel which furnishes its own power for combustion. The line pressure takes care of this item.

Successful motor courts are subject to growing pains and each new unit must be heated. Some owners feel that they cannot afford a central heating system. Many establishments have such a fluctuating percentage of occupancy that the operation of a central system is not economical. Consequently, the great demand is for individual heating equipment for each unit. Here indeed is a field where the gas-fired heating unit is preeminent. Here too is where thoughtless selection and slipshod installation of equipment has caused the ever-growing list of asphyxiations and suffocations which are a blot on the records of both the motor court and gas industries. The purpose of this discussion is to help prevent repetitions of these tragedies.

The three items to be considered in heating the individual unit with gas-fired equipment are (1) adequate size of equipment to preclude the necessity of

Reprinted from the February, 1946, issue of *Motor Court Age*.

overfiring during extreme low temperatures, (2) proper type of equipment for the purpose, (3) correct venting of the products of combustion, which includes positive ventilation of the occupied space when space heaters which use air from this space for combustion and venting are used.

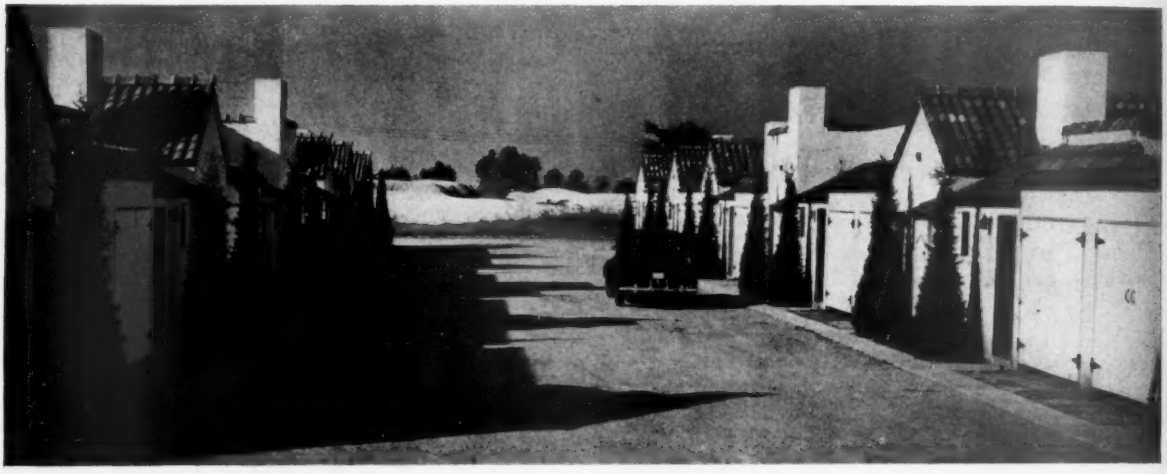
The American Gas Association Testing Laboratories have set up minimum standards of safety and efficiency which, when complied with, permit the manufacturer of gas-fired equipment to affix the blue star seal of approval to the appliance. This seal also carries the B.t.u. input and output capacity of the unit. The output capacity is the measurement of heat available when the burners are being fired at the rated input. When the heating requirements are known it is a simple matter to select the appliance with capacity to handle these requirements. Obviously this is a problem for a heating engineer, but we are concerned with the cases where the owner selects his own equipment from a mail order catalog or the floor of a hardware store. A brief non-technical formula for determining the heat loss of a structure seems in order at this time.

B.t.u. is the abbreviation of British thermal unit and is the amount of heat required to raise the temperature of a pound of water one degree Fahrenheit. It is the standard measurement of heat. Maintaining a predetermined temperature in a structure during the winter may be compared to maintaining a water level in a colander. One must determine the rate of flow through the perforations and adjust the water input to balance the leakage. The same thing happens to heat in a building. The heat passes through the surfaces of the rooms to the outside and the speed at which this heat transfer takes place depends on the construction of the surfaces. In order to determine the amount of heat required to maintain a certain room temperature we must know the types of construction of the room surfaces, the area of each type and the outside temperatures which will be encountered.

The last mentioned item must be considered first and we call this the outside design temperature. A standard method of selection of this design temperature is to add fifteen degrees to the lowest recorded temperature in the last fifteen years. If a temperature of fifteen degrees below zero has been recorded, the outside design temperature is zero. There is no need to use the lowest recorded temperature since this temperature is of rare occasion and of but a few hours duration. Experience teaches that the fly wheel effect of an already heated room will carry you through this period.

The next item is the temperature to be maintained. Standard practice is to use seventy degrees Fahrenheit for inside design temperature. Since seventy degrees at zero outside approximates the design temperatures for the greatest section of the country, it has become general practice to figure heating requirements on this basis and then add to or subtract from the figures arrived at to compensate for variations in territories where this design does not fit.

Heat transfer coefficients have been determined by various institutions such as the American Society of Heating and Ventilating Engineers for all types of building materials and the subject is highly technical. However, for standard constructions you can use the following factors to arrive at a heat loss figure for sizing appliances. Determine the square foot area of the floor and ceiling. Next figure the same area of windows and outside doors. Deduct this glass area from the area of the exposed walls for the net wall area. Multiply the floor area by the ceiling height to obtain the cubic contents and you are ready to determine the total heat loss. Use the factor seven for the floor; twenty for the ceiling if uninsulated, seven if ceiling is insulated with three-inch loose insulation; eighty for windows and doors; twenty for net exposed wall; and factor two for cubic contents. The sum of these results is the B.t.u. loss for a seventy degree temperature rise.



Motor courts such as this offer a ready market for natural gas heating

Example: Standard frame construction unit fourteen by sixteen feet with eight-foot ceiling uninsulated, three windows —thirty-inch by forty-eight-inch, two—three-foot by seven-foot doors. Unit exposed on all four sides.

	B.t.u.
Floor—14 × 16 = 224 sq. ft. × 7	1588
Ceiling—14 × 16 = 224 sq. ft. × 20	4480
Glass—Windows 3 × 10 = 30 sq. ft.	
Doors 2 × 21 = 42 sq. ft.	
Total 72 sq. ft. × 80	5760

Exposed wall—60 × 8 = 480 sq. ft. less 72 (glass) 408 net × 20	8160
Cubic Contents—224 × 8 = 1792 cu. ft. × 2	3584
Total heat loss	23,552

This heat loss indicates the B.t.u. *output* of the appliance required. An A. G. A.-approved heater rated at 35,000 B.t.u. input with 70% efficiency has an output of 24,500 B.t.u. and would be suitable for heating this space to 70 degrees at zero outside.

To compensate for temperature rises other than seventy degrees, add to or subtract from the estimated heat loss 1½% for each degree difference.

Example: 70 degrees at 10 degrees outside—10 × 1½ = 15, 100—15 = 85, 85 × 23,552 = 19,989 B.t.u. loss. In this case a 30,000 B.t.u. input heater at 70% efficiency would deliver 21,000 B.t.u. output and would be the proper size.

70 degrees at minus 10 degrees outside: 10 × 1½ = 15, 100 + 15 = 115, 1.15 × 23,552 = 27,085 B.t.u. loss. In this case a 40,000 B.t.u. input heater at 70% efficiency would deliver 28,000 B.t.u. output and would be the proper size.

Many engineers add 10% or 15% to the estimated heat loss to provide capacity for a quick pickup. It is better to improve the structure by insulating ceilings or weather-stripping. Ceiling insulation is most important. This insulation will not only pay for itself in fuel savings but will make an unbelievable difference in summer comfort.

After you have arrived at the size appliance required for the unit, you are ready to select the type of equipment suitable for your purpose. For your protection do not use any appliance which does not bear the blue star seal of approval of the American Gas Association Laboratories. For your customers' protection *do not use an unvented heater even though it does bear the A. G. A. seal of approval.* Unvented heaters are only intended to be used as auxiliary heaters and should never be used as major heating appliances. You may well ask why these heaters are not labeled to identify their purpose. Take your place in line because we have been asking the same question for years. At any rate, do not use them if you value your customers' lives. Some of these units are open flame and can be a fire hazard. Most of them are subject to over-firing by the occupant and any of them can have the air mixers fouled by lint causing improper combustion and since all the products of combustion are released within the occupied space they simply are not fit for your use.

Best Type of Equipment

The best type of equipment to use is one which draws its air for combustion and venting from outside and likewise discharges the products of combustion outside. An example of this type is the floor furnace. This appliance is giving satisfactory service in thousands of installations where circumstances permit a proper installation. Most motor courts are built too close to the ground to allow space under the floor for such an installation and consequently require a full-vented appliance installed above the floor. There are many types suitable for this purpose: full-vented circulating heaters, full-vented panel heaters for installation in the wall, full-vented gas steam radiators, etc. The chief point to remember is that a full-vented heater is only as safe as the effectiveness of the vent, flue or chimney used. If the flue is blocked or inadequate in any respect the products of combustion will be discharged into the room through the draft diverter and you are subject to all the conditions incidental to the use of unvented heaters.

When coal or wood heaters are used with an inadequate flue the room is filled with smoke and something is done about it. The products of the combustion of gas being odorless and invisible are ignored until some maladjustment takes place and this may be discovered too late. It is not necessary to have a masonry chimney to vent a gas heater. The National Board of Fire Underwriters has approved several types of pipe to be used for venting gas appliances. These items are listed as Type "B" vents for use with gas only. Installations should be made in accordance with the N.B.F.U. requirements. These requirements can be obtained from your Fire Insurance Company Agent.

Fuel combustion cannot take place and human life cannot exist without oxygen. Oxygen is free. Use it. Do not seal up rooms and expect anything but trouble. This is not an argument against good construc- *(Continued on page 190)*

Economics In a Nutshell

● A tale is told by ancient minstrels of a benevolent king who lived many years ago. His domain was afflicted by economic maladjustments which in those simple days were known as hard times.

The king wanted his subjects to have the benefits of sound and lasting economic recovery and the more abundant life. So thinking, he called together all of the economists in the kingdom—some 600 of them—and demanded of this primitive brain trust that they condense and codify their philosophy into terms that could be understood by men of average intelligence.

Sensitive to the suffering of his subjects, he asked the economists to complete their task in three months, but they backed away and said that they could not complete an undertaking of such great magnitude in less than a year, to which he agreed reluctantly.

At the year's end the economists brought to the king 600 large volumes, profusely illustrated with charts and graphs, and proudly declared their task accomplished.

After one look at their work the king, overcome by fury, had half of them beheaded and told those remaining to get busy and complete the job in three months.

When three more months had elapsed the economists submitted 150 volumes. Again half of them perished.

This process continued until only one economist remained in the entire kingdom—an old gaffer, who was told sadly by the king that he must complete the task in which his colleagues had died or suffer a like fate.

"O.K.," said the old boy, and when the king asked how much time he needed, he said, "Time, hell, I have the answer on tap!" The king said, "You know the answer must be right—or else."

The old economist bared his chest to the king's archers and said as follows: "Sire, the complete philosophy, art and science of economics may be summarized in nine words, to-wit: There ain't no such thing as a free lunch."

The old man lived for many years and was greatly honored by the king.

From a recent address by Louis Ruthenburg, president, Servel, Inc.

Floor model of Vendo cooker shown beside a modern gas range

New "Fourth Zone" Cooker

After extensive research, Vendo introduces low pressure steam cooker with broad range of possibilities for the gas industry

THE first major innovation in a cooking appliance for the American kitchen in more than a decade is the Vendo Cooker which offers the "Fourth Cooking Zone."

A low pressure steam cooker, the Vendo is the product of a W.P.B. engineer's search for a better and more certain method of cooking vegetables and other foods requiring moist heat, and at the same time eliminate pot watching.

The new gas appliance was brought to final development by one of the nation's outstanding producers of automatic equipment—The Vendo Corporation of Kansas City, Missouri, which brings to the domestic gas appliance industry a new and aggressive sales and manufacturing organization.

The Vendo Corporation carried on an intensive and thorough research program covering two years, and in which many home economists participated to perfect the cooker which now prepares quicker meals with less effort and opens up a new opportunity for providing nutrition-rich food in the home kitchen by the steam method used so successfully in commercial establishments.

Operation of the new gas appliance is simple and easy; tests have proved it to be safe, dependable and fool-proof. It is designed for installation as a self-contained gas appliance in the home kitchen, and also the unit can be incorporated as an integral part of the modern gas range.

The unit for the range is 14½ inches wide, 16 inches deep and 22½ inches high; the oven itself for separate appliance or range unit is 13½ inches wide, 15 inches deep and 8½ inches high—a capacity sufficient for most of the foods needed for an average family's meal or six quart jars of fruit to be canned.

Uses Standard Gas Burner

A gas burner of the standard top stove burner type supplies the heat for steam which is introduced within the oven and is provided from a water reservoir located in the bottom of the unit. The reservoir holds three quarts of water, is accessible for easy refilling and a float indicator tells at a glance when the reservoir is full. With average use, the water may last three days. Condensation and drainage from the oven collect in a pan in the bottom of the unit.

One Pound Pressure for Cooking

The Vendo gas cooker operates on less than one pound of pressure; the temperature and pressure of the oven are controlled automatically by a simple valve and there are no springs which might cause the tension to vary.

The steam oven door opens like any other oven door, with an easy-grip handle; this turns through 180 degrees Fahrenheit, locks the door tightly, then engages a safety-pressure control. After a brief preheating period, the oven is maintained at a constant temperature of 215 degrees F. while foods are steaming—a temperature which may be used for the entire cooking period or it may be reduced slightly if desired.

Although steam pressure and temperature are controlled automatically, the gas valve may be turned to "low" as soon as the steam pressure has steadied—if one wishes to save fuel. A whistle signal indicates when steam is beginning to waste, so the gas may then be turned to "low," after which point no further attention is required until the food is removed for serving.

Failure to turn the gas flame low at the whistle signal does not result in over-cooked food, it merely wastes gas and water in the reservoir.

To open the oven door, the handle is first turned to a fixed point until steam is released and vented, then after a slight pause, the door is opened and the food may be removed.

Several aluminum pans of convenient sizes and shapes are provided as standard equipment with the cooker, although food may be cooked in serving dishes or platters if desired.

More Nutrients Preserved

The cooker is the answer to the nutritionists' dreams—food elements remain intact as the cell structure is not broken down. Tests by a foods research laboratory show that savings of up to 40% in minerals and vitamins are effected by this new method of steam cooking.

Original forms and colors of vegetables are retained and flavors remain distinct. Steam puddings, cereals, rice and frozen foods may be cooked with strong-flavored foods without an interchange or conflict of flavors.

The steamer offers an easy and ideal

method of canning acid fruits and vegetables; the liquid in the jars does not boil away. The sterilizing qualities of the appliance are of such importance that health authorities are considering its use for this purpose alone, the Vendo Company reports. Dishes, silverware, bottles, and other utensils may be sterilized thoroughly with a minimum of effort.

A Cooker for Frozen Foods

With the anticipated up-surge in the consumption of frozen foods, the cooker offers an important addition to modern kitchen equipment since it is considered the best method yet devised of defrosting and heating frozen foods, according to tests of home economists. With this point in mind, early in the development of the cooker, the Vendo Company consulted the food research staff of a prominent air transport company because it has elaborate cooking research facilities for the purpose of studying food suitable for air travel passengers, particularly foods of the quick frozen type.

Other consultants in the development of the appliance included the household equipment staff of a leading mid-western educational institution and home economists who were authorized instructors of the Red Cross Nutrition Program. The services of a capable foods research laboratory also were employed.

Steams Foods for the Air

Although the Vendo gas cooker is now ready for extensive field test before its production for consumer distribution early in 1947 several air fields are already making installations. Eight units will be installed immediately at La Guardia Field, New York, because domestic size units permit the preparation of smaller quantities of food more frequently to assure fresher food for air passengers en route.

Self contained floor unit model showing complete meal already prepared. Vegetables, cooked side by side, retain their original vitamins, minerals, color and shape

The unit as an integral part of a modern range. Entire meal shown was cooked at the same time

Table model. Complete meals can be prepared in this cooker without the usual "pot watching"

Gas Industry Progress in Last Decade

How many gas utility men realize the progress made by this industry in the last ten years? To answer this question as fully and accurately as possible, GAS AGE recently boiled down to their fundamentals the mass of statistics available from the last decade. Here are some of the encouraging and startling figures:

Number of Customers Served Today	19,772,000
Ten years Ago	15,715,000
A 25 Per Cent Net Gain in Customers	4,057,000
Population Served Today	89,537,000
Ten Years Ago	77,770,000
A 15 Per Cent Gain in Population Served	11,767,000
Gross Annual Gas Sales in Mcf Today	2,633,239,000
Ten Years Ago	1,301,219,000
A 102 Per Cent Gain in Gas Sold	1,332,020,000
Gross Annual Gas Revenues Today	$1,108,157,000
Ten Years Ago	702,086,000
A 57 Per Cent Gain in Gas Revenues	$406,071,000
Annual Customer Consumption in Mcf Today	133
Ten Years Ago	82
A 61 Per Cent Gain in Annual Customer Consumption	51
Average Cost to Consumer Per Mcf Today is	22 Per Cent Less Than Ten Years Ago

Future of Nuclear Power

Only question of time before development of an industrial technology utilizing atomic power for peacetime progress

BY JOHN ARCHIBALD WHEELER

Associate Professor of Physics, Princeton University

On January 30, 1946 Professor J. A. Wheeler addressed the New York Chapter of the American Society of Mechanical Engineers on the future possibilities of generating power commercially through the application of atomic fission. Dr. Wheeler was well qualified to discuss this point for he had worked in collaboration with Niels Bohr, famed Danish nuclear physicist, in 1939 on the mechanism of nuclear fission. Three years later, Dr. Wheeler went to Chicago as nuclear physicist at the metallurgical laboratories where the first uranium pile was placed in operation. In 1943 he went to Wilmington to assist the Dupont Company in the design and construction of the plutonium plant in Hanford, Washington. In 1944 he went to Hanford to counsel the operators of this great project where fissionable material was produced for use in the atomic bomb.

Although not realized by many, enormous quantities of heat are being generated now as a by-product of the nuclear reactions in the manufacture of plutonium. It is the possibility of utilizing this power through engineering applications that constitutes the theme of Dr. Wheeler's presentation, briefly excerpted here.

THE Hanford plant was not built to generate nuclear energy. Its purpose was to synthesize a new chemical substance, plutonium, element 94, to make atomic bombs. The production of heat in this reaction was not merely incidental; it was a positive drawback in the program to make as much plutonium as possible. For example, the production of as much as one pound of plutonium per day requires the release of an amount of heat between one quarter million kilowatts and one million kilowatts.

In the nuclear energy plant of the future the liberation of energy in the form of heat or otherwise will be the primary objective and the production of plutonium or other substances subject to nuclear fission will be secondary. But the most difficult problems will still be engineering problems: first, to transfer heat from the chain-reacting structure, the so-called pile, to a cooling fluid, and second, to convert this heat into useable energy.

The problems of nuclear physics which enter into the design of the power producing pile of the future have in principle been solved. The concensus of opinion of the industrial men and the scientists who have been connected with the uranium project indicates that, assuming freedom to develop, it is only a question of time before we shall have an industrial technology of nuclear energy which can pay its own way. That time interval will depend most of all upon the engineering talent which is applied to the solution of the engineering problems of the pile.

Power Plant of Future

As for the pile of the future, nuclear physics tells us that this power plant will be in six important ways quite similar to the present Hanford piles.

1. The reaction will be fission.
2. There must be present a basic material to undergo fission.
3. The pile must produce new fissionable material.
4. For this purpose the raw material will be uranium or possibly thorium.
5. A chemical separation plant will be required.
6. Finally, heavy shielding is necessary to protect the workers.

Nothing has been said about a cooling fluid, assuming its existence implied by the term "power plant." In the Hanford piles the cooling fluid is water; in the future power plant this fluid will be some substance capable of going to much higher temperatures than water without requiring very high pressures. High pressures would require heavy piping; but every foreign material introduced into the pile absorbs neutrons and makes it that much more difficult to run the unit efficiently.

In contrast to the pressure, the temperature of the pile is a matter of relative indifference from the point of view of the nuclear chain reaction. It matters little to the fission fragments whether the temperature of the uranium is a few hundred degrees or more than a thousand degrees, for their own instantaneous energy at the moment of production is equivalent to more than a billion degrees.

It will therefore be reasonable to operate at as high a temperature as our materials of construction will stand, and gain all the thermodynamical efficiency that we can in our power plant. The cooling fluid, whatever it is, will then be led out to a heat exchanger. There its energy will be turned over to water or mercury or some other substance capable of driving a turbine or other prime mover. That is the power plant of the future.

Common to the future plant and the present Hanford piles is the requirement to protect personnel from radioactive radiations. Not only does the act of fission liberate fast and penetrating neutrons, but it also releases electromagnetic radiations which have the same character as x-rays and even greater piercing power. These so-called gamma rays, together with the neutrons coming from a pile in full production, have an intensity, near such a reactor, more than a million times as great as can be tolerated biologically by the human organism. It is necessary to surround the pile with a shield which will cut down the intensity of these radiations to a negligible level.

You can imagine the difficulties which arise in obtaining complete protection when you consider that there must be openings in the shield for the entrance and discharge of the cooling fluid and for the inser- *(Continued on page 186)*

POINT OF VIEW

WE know of one enterprising business man, the head of a successful, growing company, who was asked, "How do you happen to stumble on all these new products?" Pointing to the Research Building across the way, he replied, "Well, you see we maintain a 'Stumbling Department' especially for that purpose."

—From "The Research Viewpoint," published by Gustavus J. Esselen, Inc., Boston, Mass.

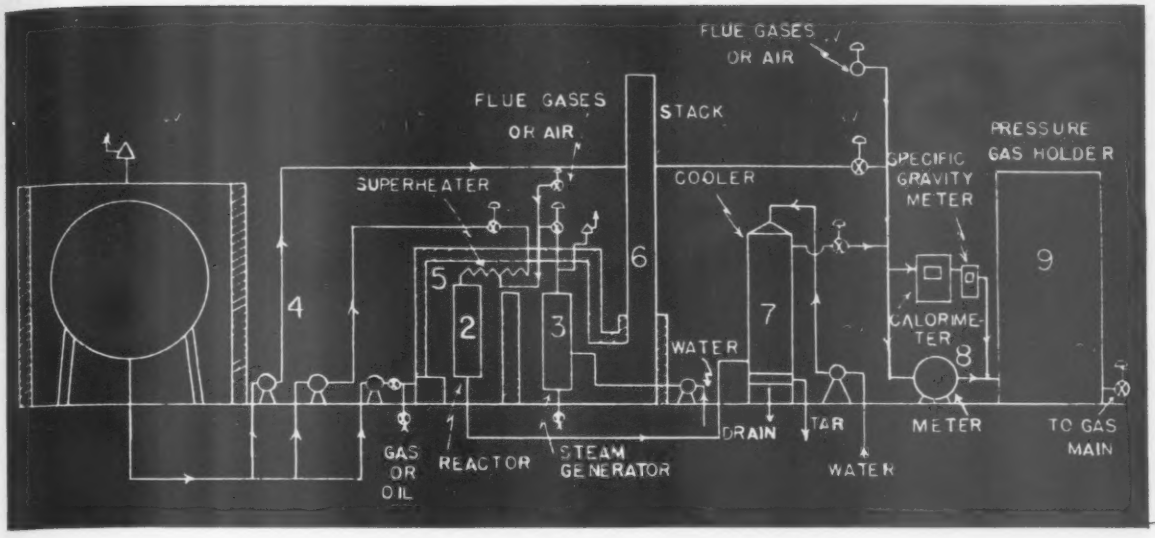


Fig. 1. Proposed self-contained plant for generating peak load gas

Catalytic Gasification of Higher Hydrocarbons

Final Report to A. G. A. Gas Production Research Committee on Project CPR-1B gives results when catalytic gasification is applied to propane, butane and other gases

BY C. H. RIESZ, V. I. KOMAREWSKY, L. J. KANE, FRANCES ESTES, AND PIERRE LURIE

This is a final report on the results of a study allocated to the Institute of Gas Technology in January, 1945, by the Gas Production Research Committee—the first of all those projects now being studied upon which a final report has been received.

This phase of the work has been completed. No further work will be done upon it. The amount of money authorized for this work was $14,800; amount spent $14,662.21. The authorization is now closed.

P. T. DASHIELL, Chairman, Gas Production Committee, American Gas Association

Introduction

Hydrocarbon gases are used by the gas industry in a variety of ways—for cold enriching, for reforming in water gas sets, as propane or butane air mixtures, etc.

Where distribution capacity is not critical and where these hydrocarbon gases can be used in existing water gas sets for either enriching or reforming, the plant capacity may be increased in many cases. A partial bibliography showing references that will be available to most readers and describing this well developed art of pyrolytic reforming follows the Institute of Gas Technology report.

Propane-air plants are used for both base and peak load plants and were described in a recent report "The Utilization of Natural Gas Condensates" prepared by the Institute of Gas Technology and published by the American Gas Association. These plants are now being installed by some of the larger gas companies for peak load plants.

This report by the Institute of Gas Technology is a final report on a project originally authorized to study the catalytic reforming of higher hydrocarbons. When this project was authorized it was proposed to make a gas of about 550 B.t.u. directly from propane or higher hydrocarbons such as kerosene or gas oil by catalytic reforming with steam in a tubular type of apparatus. It was proposed to avoid complete cracking of the hydrocarbon by using relatively high space velocities.

As the report shows, it was found that the limiting factor in this operation was the deposition of carbon on the catalyst which occurred when the utilization of carbon by the blue gas reaction was incomplete. In general the heavier the hydrocarbon the lower the temperature required for cracking. With propane it was found that cracking took place at temperatures below those required for the blue gas reaction. A catalyst was developed which gave indications of allowing continuous operation with propane at temperatures as low as 1200° F. One interesting result of this work was the absence of olefines in the partially cracked gas. It is not clear whether this is the effect of the low temperatures used or whether the catalyst served as a hydrogenation catalyst or both.

It was apparent that a gas of about 300 B.t.u. will be produced under any conditions that will assure an absence of troubles from carbon accumulations and that a gas of higher B.t.u. cannot be produced by this method without carbon troubles. This limitation on the calorific value of the gas to about 300 B.t.u. restricts the application of this method to hydrocarbons that are sufficiently volatile for direct use as cold enrichers for increasing the thermal value of the gas. Hydrocarbons of higher molecular weight, such as gas, oil or kerosene, would not only increase the tendency for carbon accumulations in the cracking process, but they could not be used directly as cold enrichers.

Those interested in a further study of these cracking reactions will find excellent bibliographies attached to an article entitled "Thermal Polymerization Process Used by Pure Oil on Olefine-Bearing Gases" by Cook, Swanson and Wagner which appeared in the November 14, 1935 issue of the Oil and Gas Journal, and an article "Catalytic Cracking of Pure Hydrocarbons" in the June 1945 issue of Industrial and Engineering Chemistry by Greensfelder and Voge. An article entitled "The Commercial Production of Pure Hydrogen from Hydrocarbons and Steam" by Reed presented to the American Institute of Chemical Engineers and published in their Volume 41, No. 4, August 25, 1945 is

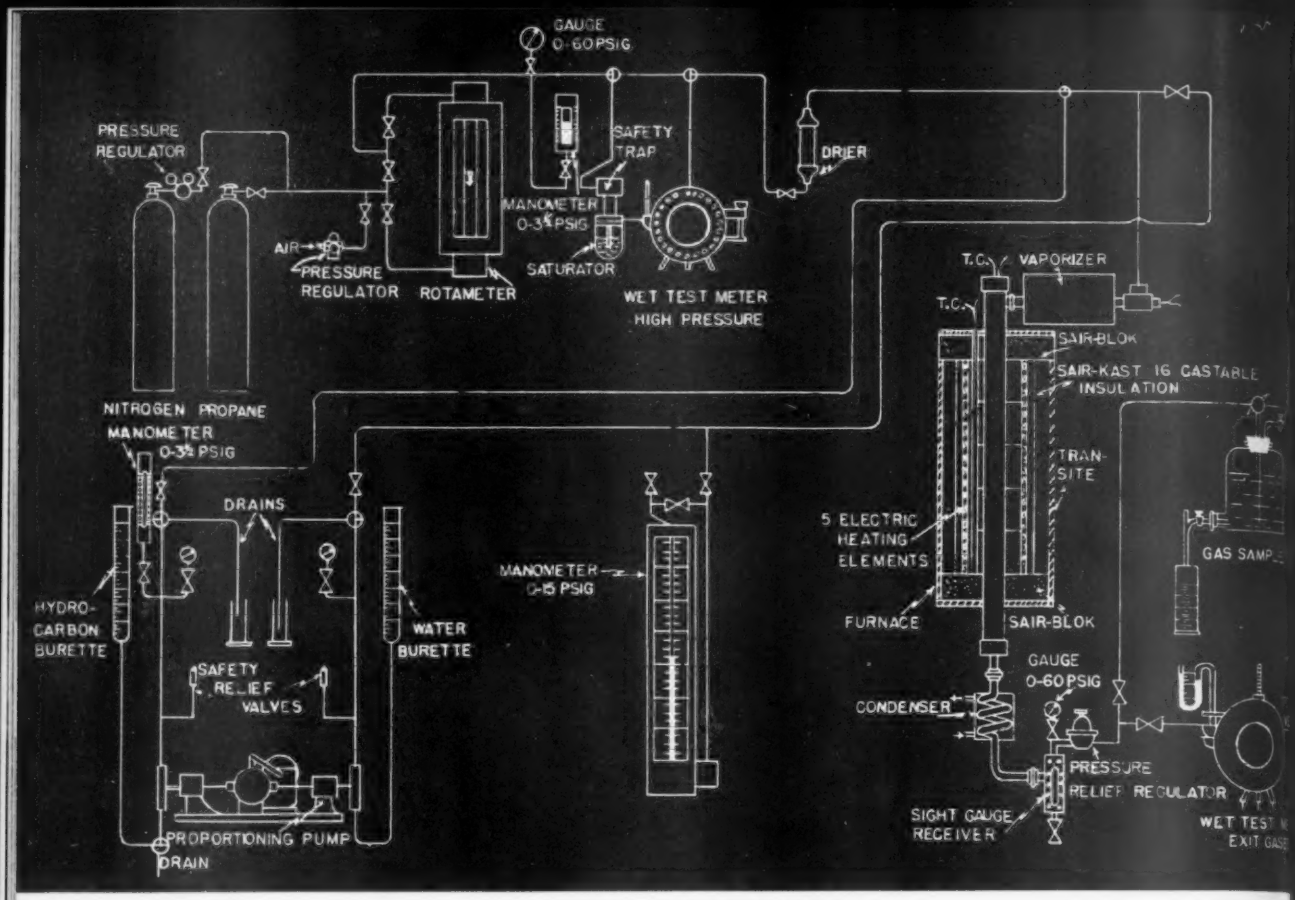


Fig. 2. Catalytic gasification of higher hydrocarbons

an excellent reference on the subject.

The commercial production of hydrogen from hydrocarbons is well developed and many plants are in operation throughout the country. The Institute of Gas Technology has been authorized to purchase a small pilot plant in order to proceed with the investigation of the catalytic and pyrolytic reforming of lighter hydrocarbon gases such as propane and butane.

—EDWIN L. HALL, Secretary-Coordinator
Gas Production Research Committee

DURING the war years the gas industry contributed much to the ultimate victory by supplying adequate gas to industrial and domestic consumers although at times, the gas industry had difficulty in meeting all demands.

In the postwar period, an expansion in home and space heating loads will aggravate the extreme peak demands which have to be met on one to perhaps fourteen days of a given year due to a particularly cold spell of weather. It is obvious that continued acceptance of heating loads depends upon the ability of the gas industry to meet any and all demands. In the past, such peak demands have been handled mainly by water gas sets. The equipment investment costs of such installations are of the order of $150-200 per thousand cubic foot daily capacity. Propane-air and butane-air plants have much lower investment costs (about $30-50 per thousand cubic foot daily capacity) and are more suitable, therefore, for use as peak load plants from this viewpoint. However, the gas produced is usually only interchangeable in part with regular gas, especially in case of manufactured gas.

It is proposed to employ the catalyzed steam-hydrocarbon reaction as a means of obtaining a low-cost plant for producing peak load gas. With propane as a gasification material, the main reactions are:

$$C_3H_8 + 3\ H_2O \rightarrow 3\ CO + 7\ H_2 \qquad (1)$$

$$C_3H_8 + 6\ H_2O \rightarrow 3\ CO_2 + 10\ H_2 \qquad (2)$$

The carbon oxides and hydrogen produced serve as a carrier gas to which a rich hydrocarbon gas, such as propane, may be added to obtain a desired heating value. A flow diagram of such a proposed unit is shown in Figure 1. Propane is pumped from a storage tank (1) to a reactor (2) where it meets steam generated in (3) and superheated in (5). The gas produced is cooled with a spray of water in (7) and is mixed with propane vapors from (4) to the desired heating value. After metering (8), the gas passes into a small holder (9) from which it is released to the gas main. For further control of both heating value and gas gravity, air or flue gases may be added either before or after the reforming, or both.

Since propane and butane require relatively costly storage facilities, it would be an advantage if higher liquid hydrocarbons of the nature of gasoline, kerosene and gas oil could be used as gasification materials. This phase of the problem was also considered in the present work.

Chemical Reactions Involved

When hydrocarbon material is subjected to high temperature, many reactions can be expected to take place. The following equations, employing pro-

pane as a gasification material are indicative of the scope and nature of the reactions involved.

$$C_3H_8 \rightarrow C_3H_6 + H_2 \quad (3)$$
$$C_3H_8 \rightarrow C_3H_4 + 2\ H_2 \quad (4)$$
$$C_3H_8 \rightarrow C_2H_4 + CH_4 \quad (5)$$
$$C_3H_8 \rightarrow C_2H_2 + CH_4 + H_2 \quad (6)$$
$$C_3H_8 \rightarrow C_2H_6 + C + H_2 \quad (7)$$
$$C_3H_8 \rightarrow C_3H_4 + C + 2\ H_2 \quad (8)$$
$$C_3H_8 \rightarrow C_2H_2 + C + 3\ H_2 \quad (9)$$
$$C_3H_8 \rightarrow CH_4 + 2\ C + 2\ H_2 \quad (10)$$
$$C_3H_8 \rightarrow 2\ CH_4 + C \quad (11)$$
$$C_3H_8 \rightarrow 3\ C + 4\ H_2 \quad (12)$$

In the presence of catalysts, certain of the reactions can be promoted to the exclusion of others, e.g., dehydrogenation to propylene.[1] However, the formation of carbon is by far the most characteristic feature of high temperature decomposition and is the limiting factor in such operations.

To minimize carbon formation, decreased contact time or dilution with an inert gas may be of value. However, removal of carbon, as it is formed, by steam or oxygen is a relatively direct expedient, namely,

$$C + H_2O \rightarrow CO + H_2 \quad (13)$$
$$C + 2\ H_2O \rightarrow CO_2 + 2\ H_2 \quad (14)$$
$$2\ C + O_2 \rightarrow CO_2 \quad (15)$$

While combustion with oxygen is a rapid, exothermic reaction, the blue gas reaction requires heat and is relatively slow. It is of advantage to employ both reactions simultaneously.

The conversion reactions in the case of propane are:

$$C_3H_8 + 3\ H_2O \rightarrow 3\ CO + 7\ H_2 \quad (1)$$
$$C_3H_8 + 6\ H_2O \rightarrow 3\ CO_2 + 10\ H_2 \quad (2)$$

However, if only three moles of steam are employed per mole of propane and the reaction is allowed to attain equilibrium, considerable carbon formation can be expected at 1500° F. and below (Table 1).[2] For example at 1340° F., 4.1 per cent of the products will be carbon if one mole of propane and three moles of steam are the reactants. While no appreciable carbon formation is indicated when six moles of steam per mole of propane is employed, practically, a much higher ratio of steam to propane must be employed to avoid carbon formation entirely at temperatures below 1500° F. This is due to the slow velocity of the blue gas reaction below 1500° F.

Previous Work

The field of catalytic conversion of hydrocarbons by steam into carbon oxides and hydrogen has been covered extensively, especially in the case of methane.[3, 4] Most of the work has been concerned with the production of hydrogen from methane; it is only recently that higher hydrocarbons, such as propane, have been employed.[5, 6] Work has also been done with the aim of producing nitrogen-hydrogen mixtures for utilization in ammonia synthesis.

While the complete conversion of the lower hydrocarbons has been investigated in some detail, information is lacking on incomplete conversion of hydrocarbons to carbon oxides and hydrogen.[7]

It would be desirable to leave unconverted sufficient gaseous hydrocarbons to produce a gas which would have a relatively high heating value, e.g., 550 B.t.u. per cubic foot. Therefore, an extensive part of the present investigation was directed toward determining whether incomplete conversion could be obtained with catalyst contained in a conventional, fixed bed, tube apparatus.

Experimental

MATERIALS. Propane (99.9% purity) was obtained from the Ohio Chemical and Manufacturing Company. Commercial normal hexane was obtained from the Phillips Petroleum Company; a typical composition of the material is 75 per cent normal hexane and 25 per cent methycyclopentane.

CATALYSTS. Catalysts were prepared by impregnating activated alumina pellets (1/8-inch size; Harshaw Chemical Company) with nickel nitrate. Nickel concentration on the catalyst was 5, 10 and 15 per cent by weight.* A catalyst for the steam-hydrocarbon reaction used in commercial operation was also tested.

APPARATUS AND PROCEDURE. A diagrammatic sketch of the experimental

[1] Riesz, Pelican and Komarewsky, *Oil Gas J.*, 43 No. 10, 67-9, 96-7 (1944).

[2] Calculated by (Mrs.) Lee Kanner by means of a method developed by J. D. Parent, Institute of Gas Technology, Chicago, Illinois.

[3] Ellis, *The Chemistry of Petroleum Derivatives*, Volume 1, Chapter 10; Volume II, Chapter 10. Reinhold Publishing Company, New York (1934) (1937).

[4] Egloff, *The Reactions of Pure Hydrocarbons*, Reinhold Publishing Company, New York (1937).

[5] Rakovsky and Burinova, *J. Appl. Chem.* (U.S.S.R.) 14, 449-465 (1941).

[6] Reed, *Trans. A. I. Ch. E.*, 41, 453-62 (1945).

[7] Guyer, Setrum and Huppke, *Gas Age-Record*, 69, 683-6, 700-1 (1932).

TABLE 1

EQUILIBRIUM CONCENTRATIONS FROM THE INTERACTION OF PROPANE AND STEAM*

980° F.				1340° F.				1520° F.			
Reactants moles	*Products moles*	*Products (dry gaseous) Percent*	*Products (total) Percent*	*Reactants moles*	*Products moles*	*Products (dry gaseous) Percent*	*Products (total) Percent*	*Reactants moles*	*Products moles*	*Products (dry gaseous) Percent*	*Products (total) Percent*
C_3H_8–1	C –0.87		C –12.1	C_3H_8–1	C –0.38		C – 4.1	C_3H_8–1	C –0.056		C – 0.6
H_2O–3	H_2O–1.72		H_2O–23.8	H_2O–3	H_2O–0.50		H_2O– 5.3	H_2O–3	H_2O–0.15		H_2O– 1.6
	H_2 –2.50	H_2 –54.0	H_2 –34.6		H_2 –5.78	H_2 –68.8	H_2 –62.3		H_2 –6.53	H_2 –69.0	H_2 –67.5
	CH_4–1.39	CH_4–30.1	CH_4–19.3		CH_4–0.36	CH_4– 4.3	CH_4– 3.9		CH_4–0.16	CH_4– 1.7	CH_4– 1.6
	CO –0.194	CO – 4.2	CO – 2.7		CO –2.02	CO –24.0	CO –21.8		CO –2.72	CO –28.7	CO –28.1
	CO_2–0.542	CO_2–11.7	CO_2– 7.5		CO_2–0.24	CO_2– 2.9	CO_2– 2.6		CO_2–0.06	CO_2– 0.6	CO_2– 0.6
C_3H_8–1	C –nil		C – nil	C_3H_8–1	C – nil		C – nil	C_3H_8–1	C – nil		C – nil
H_2O–6	H_2O–3.32		H_2O–35.5	H_2O–6	H_2O–2.26		H_2O–17.7	H_2O–6	H_2O–2.34		H_2O–18.1
	H_2 –3.04	H_2 –50.4	H_2 –32.5		H_2 –7.52	H_2 –71.6	H_2 –58.8		H_2 –7.64	H_2 –71.8	H_2 –58.8
	CH_4–1.50	CH_4–24.8	CH_4–16.0		CH_4–0.11	CH_4– 1.0	CH_4– 0.9		CH_4–0.008	CH_4– 0.1	CH_4– 0.1
	CO –0.32	CO – 5.3	CO – 3.4		CO –2.04	CO –19.3	CO –16.0		CO –2.32	CO –21.8	CO –17.9
	CO_2–1.18	CO_2–19.5	CO_2–12.6		CO_2–0.85	CO_2– 8.1	CO_2– 6.6		CO_2–0.67	CO_2– 6.3	CO_2– 5.1

*Calculated by (Mrs.) Lee Kanner by means of a method developed by J. D. Parent from equilibrium data given by Wagman, Kilpatrick, Taylor, Pitzer and Rossini, National Bureau of Standards, RP 1634.

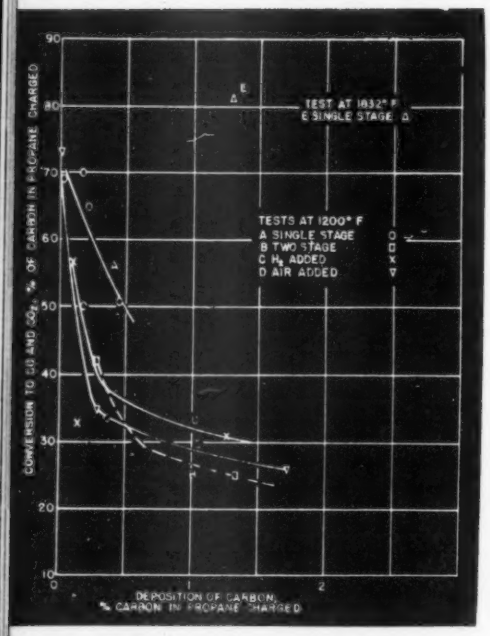


Fig. 3. Gasification of propane with a nickel-alumina catalyst

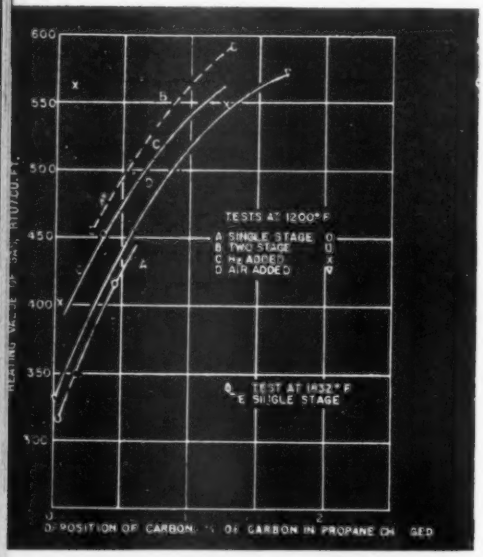


Fig. 4. Heating value—carbon deposition relationships in gasification of propane over nickel-alumina catalyst

apparatus is shown in Figure 2. Means is provided for pumping out liquid hydrocarbon from a burette or for metering the flow of gaseous hydrocarbon. In either case the hydrocarbon passes to a vaporizer where it is mixed with steam generated from water also pumped to the vaporizer. The uniform mixture of hydrocarbon vapors and steam pass down through the catalyst bed maintained in an alloy reactor tube (½ inch pipe size) contained in an electrically heated furnace. The amount of catalyst was 0.001 cubic foot in most of the tests. The gases produced pass through a tubular condenser and a receiver where unreacted water is recovered. The exit gases are then metered and sampled. The usual test was for a period of two to four hours, although 48-hour tests were made in the final experiments.

ANALYSIS. Gases were analyzed by the Gockel method.[8] Heating value and gas gravity were calculated from the analysis.

[8] *Universal Oil Products Laboratory Test Methods for Petroleum and Its Products.* Universal Oil Products Company, Chicago (1940), U.O.P. Method No. G84-40.

TABLE 2

PROPERTIES OF GAS FROM GASIFICATION OF PROPANE OVER A 15% NICKEL–85% ALUMINA CATALYST

Gas analysis, %	
Carbon dioxide	14.1
Total olefins	0.0
Oxygen	0.3
Carbon monoxide	6.9
Hydrogen	72.1
Paraffins	5.8
Nitrogen	0.8
Paraffin index	1.14
Heating value, B.t.u./cu.ft.*	315
Specific gravity (air = 1.00)*	0.38

* Calculated from gas analysis (60° F., 30.0 inches mercury, saturated).

Discussion of Results

DEVELOPMENT OF CATALYST. Most of the information in the literature deals with relatively high temperature operation (1400-1600° F.). It was of practical interest to see whether lower temperatures could be obtained with more active catalysts. Investigation of nickel-alumina catalysts containing 5, 10 and 15 per cent nickel showed that as the nickel concentration was increased the catalyst became more active for the propane-steam reaction. It was found that for a 15 per cent catalyst, 1200° F. was sufficient to give a rather complete conversion of propane to carbon monoxide, carbon dioxide and hydrogen at a hydrocarbon space velocity of about 500 volumes of propane per volume of catalyst per hour and 15 volumes of steam per volume of propane vapor. Carbon deposition was very small over a 48-hour test period. Gas produced has the properties indicated in Table 2.

CATALYTIC GASIFICATION OF PROPANE. An extended series of experiments was carried out with propane at 1200° F. to investigate the possibility of incomplete conversion. The results are expressed in Figure 3. The tests were made under a wide variety of conditions and the curves indicate the effects of various types of operation. With normal operation, carbon was always formed when the conversion of carbon in the propane charged to carbon monoxide and carbon dioxide was less than about 70 per cent (curve A). The remainder of the carbon in the propane charged was recovered as carbon deposited on the catalyst and as gaseous hydrocarbons, e.g., methane. With propane gasified in two stages, less carbon was formed (curve B). However, to eliminate carbon deposition entirely, a high conversion is required.

Hydrogen appeared to be effective in suppressing carbon formation (curve C). Air was very efficient in removing carbon or retarding carbon formation; however, nearly complete conversion (above 70 per cent) of the carbon in propane to carbon monoxide and dioxide was required to avoid carbon deposition entirely (curve D).

By-Word

● An Army colonel who had the reputation of being quite a peptalker called his men together frequently to inspire them to greater achievements. He was rather oratorical and dramatic in his delivery and his listeners generally enjoyed the rallies he held as much as the Colonel enjoyed his part in them. There was one occasion, however, when the Colonel found himself the victim of a humorous situation that gave him several uncomfortable moments.

He had had no time to select a subject upon which to speak and found himself at a loss as to what to say. As he entered a door to the hall where his men were assembled he noticed the word, "Push," and happily adopted it for his topic. He quickly thought of a suitable opening and worked up to the chest-pounding stage with comparative ease. Then with an air of pride and confidence he orated, "And if you men want to know what has put me where I am just turn around and read the word on that door back there." Turning as one man, the group read on the inward side of the door the word "Pull."

—The Pick-Up, United Parcel Service

All of the previous work was at 1200° F. A single test at 1832° F. gives an indication that for high temperature operation, conversions higher than 70 per cent may be required to eliminate carbon deposition.

Another method of interpreting the data is a plot of the heating value of the gas produced versus the carbon formed (Figure 4). The correlation demonstrates that for zero carbon formation, a gas of heating value slightly above 300 must be produced (curve A). The use of air, hydrogen, two-stage addition of propane may allow somewhat higher heating values (curves D, C, B). However, there is no indication that gas of 550 B.t.u. heating value, for example, could be produced without some carbon deposition.*

CATALYTIC GASIFICATION OF HEXANE. The gasification of a hexane fraction was also studied to test the possibility of gasifying light liquid hydrocarbon fractions. Carbon deposition was always noted when hexane was gasified in such a manner that sufficient residual gaseous hydrocarbon remained unconverted to produce a relatively high heating value gas. A few selected experiments are shown in Figure 5. As the temperature was decreased from 1800 to 1700 and 1200° F., the steam-hydrocarbon ratio was increased approximately 1.8 times and 6.7 times, respectively. At the lowest temperature, 43.5 moles of steam per mole of hexane were utilized. Since carbon deposition was found in all these experiments, higher steam-hydrocarbon ratios would be required to eliminate carbon formation entirely. This, in turn, would produce practically complete conversion of the hexane to carbon oxides and hydrogen. The gas formed would have a low heating value, e.g. around 300 B.t.u. per cubic foot.

CATALYTIC GASIFICATION OF LIQUID HYDROCARBONS. The study was limited to propane and hexane as gasification materials. However, from this and other considerations, it is believed that from any hydrocarbon material which contains substantial amounts of propane or hydrocarbons higher than propane, carbon deposition will always occur if the reaction is conducted to permit in the gas sufficient hydrocarbon gases to give a relatively high heating value product. The results with propane and hexane indicate that for conditions which permit a substantial quantity of gaseous hydrocarbon to remain in the process gas, carbon will be formed more rapidly than steam can utilize the carbon by the blue gas reaction. Since this was found for propane, it would be expected that carbon would be accumulated on the catalyst even more rapidly with hydrocarbons higher than propane, i.e., liquid hydrocarbons. This was confirmed in the case of hexane.

If special processes can be considered for the gasification of liquid hydrocarbons, a preliminary cracking step which produces gaseous hydrocarbons might be of value. The cracked gases could then be put through the catalyzed steam-hydrocarbon process to obtain a low heating value gas which would be enriched by addition of cracked gases to the desired heating value. If a regenerative process or a fluidized reactor system could be employed, then carbon deposition would no longer be a limiting factor. Such processes could probably be developed but would require more complicated and presumably more expensive equipment.

CATALYTIC GASIFICATION OF PROPANE AND BUTANE. The finding that a high heating value gas has not been produced from higher hydrocarbons by a simple, single-stage process does not detract from the value of catalytic gasification of propane and butane. The complete or nearly complete conversion of propane and butane to carbon monoxide, carbon dioxide and hydrogen is well-known and conditions for obtaining this result are readily ascertained. Addition of appropriate quantities of propane or butane vapors to the blue gas will give a gas of desired heating value. Dilution of the blue gas with either products of combustion or air will permit control of both the heating value and specific gravity of the finished gas. As an alternative, an air-steam mixture might be used for reforming the hydrocarbon gases. The amount of air utilized to manufacture the blue gas-producer gas mixture would control heating value and specific gravity of the finished gas.

A very important advantage of operation as indicated above is the possibility of gas generation at less than maximum capacity. In other words, the send-out of a particular plant is not fixed, but the generation of a gas of desired thermal and gravity characteristics can be varied over a relatively wide range. The plant may also have sufficient flexibility to permit the omission of a gas holder.

NEED FOR CONTINUED RESEARCH ON CATALYSIS. Low temperature operation is desirable for reducing the requirements for heat resisting alloy reaction tubes. It was found that a commercial catalyst was not active below 1500° F. and it was necessary to prepare a nickel-alumina catalyst which was found to be active at 1200° F. It might be possible to reduce the operating temperature still further. A catalyst which would inhibit cracking selectively and permit the blue gas reaction to remove any carbon formed would also be desirable; slightly higher temperatures might be required in this instance. Catalysts which are not sensitive to sulfur poisoning and which are utilizable with olefin hydrocarbons would also be of value.

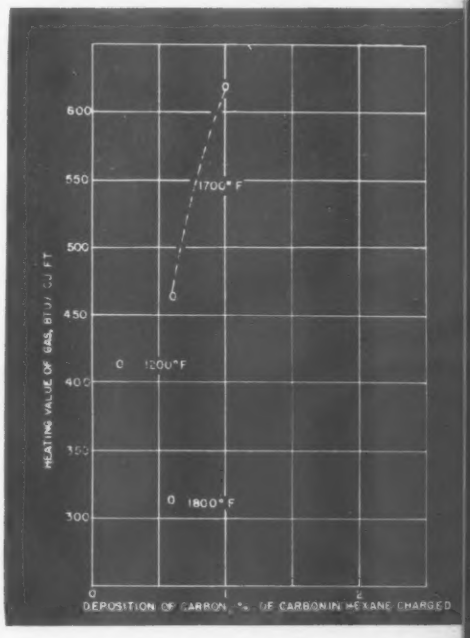


Fig. 5. Heating value—carbon deposition relationships in gasification of hexane over nickel-alumina catalyst

Future Work

A unit which produces special furnace atmospheres by means of the propane-steam reaction has been ordered from

*A high heating value product with the deposition of only a small amount of carbon was found in a few cases. More experimental values would be needed to verify the curves drawn in Figure 3, 4 and 5; however, this does not seem necessary at the present time.

the Surface Combustion Company; delivery was expected during March, 1946. The unit will be operated as a pilot plant for further investigation of the catalyzed hydrocarbon-steam reaction as a means of developing a process for peak load gas generation.

Summary and Conclusions

A study of the catalytic gasification of hydrocarbons with steam has indicated that a light hydrocarbon, such as propane, can be completely converted to carbon monoxide, carbon dioxide and hydrogen at temperatures well below those normally utilized for the blue gas reaction. If incomplete conversion is desired in order to leave sufficient gaseous hydrocarbons in the gas to obtain a relatively high heating value, the necessary operating temperatures are so low that carbon troubles can be anticipated. It appears that in order to permit an appreciable quantity of gaseous hydrocarbons in the process gases, a catalyst must be developed that promotes the carbon-steam reaction at comparatively low temperatures or else inhibits cracking selectively to allow the blue gas reaction to remove all carbon deposited, perhaps at a somewhat higher temperature.

Commercial catalytic processes have been developed which cause the reaction of hydrocarbon gases with steam to proceed almost completely to carbon monoxide and hydrogen at temperatures of about 1500° F. When desired, commercial processes utilize a mixture of air and steam with the hydrocarbon gas in order to generate a gas containing some nitrogen and which then resembles a blue gas-producer gas mixture. A catalyst prepared in the present work appears to complete the reaction with steam, in the presence or absence of air, at temperatures as low as 1200° F. However, to avoid carbon formation, practically complete conversion of the hydrocarbon gas to carbon oxides and hydrogen is also required.

Blue gas or blue gas-producer gas mixture, obtained by complete catalytic gasification of hydrocarbons, may be readily enriched to the desired thermal value by addition of propane or butane vapors; specific gravity may be controlled by the amount of air used in the reforming operation. Alternately, air or products of combustion can be employed as a diluent for blue gas produced by using only steam for the reforming; this mixture can be brought to the required heating value by inclusion of the appropriate amount of propane or butane vapors.

If higher hydrocarbons including gasoline, kerosene and gas oil are considered as gasification materials, it will probably be necessary to obtain a hydrocarbon gas from these oils by a preliminary cracking step; this gas might be converted to blue gas and used for enriching. Such a process does not appear promising in the present state of the art.

In summary, laboratory studies have indicated that catalytic gasification of hydrocarbons can be applied to propane and butane and other paraffin gases if the process is carried to nearly complete conversion or, *(Continued on page 190)*

Reconversion

●The days are gone when postwar dreams
Could substitute for immediate schemes;
When guessing the shape of things to come
Taxed the creative cranium,
And flights of fancy took the place
Of looking Markets in the face.

—Orville E. Reed in *Printers' Ink*

Plumbers Hear Gas Water Heating Plans

Stage setting for Portland preview of gas water heating equipment

THAT merchant plumbers in the Portland, Ore., area see a big market for gas water heaters and want to cash in on it was evident by attendance at a sales meeting sponsored by Portland Gas & Coke Company February 28.

More than 350 merchant plumbers, distributors and manufacturers, their wives and sales personnel were present for the supper, dramatized sales presentation and display of the latest in gas water heating equipment.

A score of gas company people participated in a fast-moving preview of the 1946 advertising campaign for automatic gas water heating, which added up to 96 million messages via magazines, radio, newspapers, billboards, etc., and 50,000 personal calls in this area. Each advertising media was represented by a "step" on a "ladder of profits."

The new Gas Water Heater Sizing Chart developed by the water heater council of the Pacific Coast Gas Association was presented by Clyde E. Potter of Los Angeles, manager of appliance sales for Southern Counties Gas Company. He explained how the new chart, now being distributed, determines hot water needs according to rooms in the home rather than by occupants.

Using as a theme, "60 Gallons in 90 Minutes," C. W. Steele of Portland Gas & Coke Company previewed the hot water requirements of a modern home with its hot-water-consuming automatic devices and told how the inherent speed of modern gas water heaters enables the merchant plumber to meet the challenge.

A. O. Leech, also of Portland Gas & Coke, described new developments in commercial gas water heaters which also enable the merchant plumber to meet increasing demands for hot water for cleaning and sterilizing in restaurants and other volume cooking establishments.

Natural Gas Department Spring Meeting

THE natural gas industry's place in the world of tomorrow will be the theme of the spring meeting of the A. G. A. Natural Gas Department which will be held at the Hotel Gibson, Cincinnati, on May 7 and 8. Trends in regulation, industrial relations, promotion, and research will be discussed by leaders in the industry. A strong program under the direction of the Program Committee, appointed by the Association's Vice-President R. H. Hargrove, with Walter C. Beckjord as chairman, is virtually complete for the meeting.

The plan of the meeting is to have two morning general sessions for presentation of papers on matters of timely interest and importance in the problems of management. The afternoon periods will be devoted to parallel open sessions of the Department's Committees on Transmission, Production and Storage, Accounting, and Large Volume Sales.

The Technical and Research Committee will hold a closed luncheon meeting on Monday noon, May 6.

A dinner meeting of the Managing and Advisory Committees of the Department, to which have been invited several guests from among city officials and others, will be held on Tuesday evening, May 7.

The tentative program is as follows:

Tuesday, May 7, 10:00 A.M.

Opening Remarks. R. H. Hargrove, Chairman, Natural Gas Department, A. G. A.; Vice-President and General Manager, United Gas Pipe Line Company, Shreveport, Louisiana

Greetings. Honorable James G. Stewart, Mayor of Cincinnati, Ohio

The Job Ahead of the Gas Industry. E. J. Boothby, President, American Gas Association; Vice-President and General Manager, Washington Gas Light Company, Washington, D. C.

Trends in Industrial Relations. Fred R. Rauch, Chairman, A. G. A. Personnel Committee; Manager, Industrial Relations, Cincinnati Gas and Electric Company, Cincinnati, Ohio

Recent Court and Commission Decisions Affecting Natural Gas. William A. Dougherty, Vice-President and Counsel, Consolidated Natural Gas Company, New York, New York

Gas Turbines. J. K. Salisdury, General Electric Company, New York, New York

F.P.C. Natural Gas Investigation. Panel Discussion by E. Holley Poe, E. Holley Poe and Associates, New York, New York; and other utility executives.

Wednesday, May 8, 9:00 A.M.

Address. H. Carl Wolf, Managing Director, American Gas Association, New York, New York

Research in the Natural Gas Industry. H. D. Hancock, Chairman, Technical and Research Committee, Natural Gas Dept., A. G. A.; President, Gas Advisers, Incorporated, New York, New York

Industry Promotion Program. D. A. Hulcy, Chairman, Promotional Committee, A. G. A.; President, Lone Star Gas Company, Dallas, Texas

Gasoline from Natural Gas. P. C. Keith, President, Hydrocarbon Research, Incorporated, New York, New York

Progress Report of Natural Gas Reserves Committee. Lyon F. Terry, Vice-Chairman, Committee on Natural Gas Reserves, A. G. A.; Second Vice-President, Chase National Bank, New York, New York

German Synthetic Fuel and Lubricant Industry. E. S. Pettyjohn, Captain, U.S.N.R., Institute of Gas Technology, Chicago, Illinois

LP Gas and Its Utilization by the Natural Gas Industry. Francis E. Drake, Pacific Gas Corporation, New York, New York

AFTERNOON PARALLEL SESSIONS

May 7 and 8, 2:00 P.M.

TRANSMISSION SYMPOSIUM

Presiding, H. J. Carson, Chairman, Transmission Committee, A. G. A.; Vice-President, Northern Natural Gas Company, Omaha, Nebraska

1. Natural Gas Hydrates. W. M. Deaton, United States Bureau of Mines, Washington, D. C.
2. Radio Systems for Pipe Lines. W. T. Bulla, Superintendent, Communications and Dispatching, Natural Gas Pipeline Company of America, Chicago, Illinois
3. Field Compressing Stations, C. S. Worley, Consolidated Gas Utilities Corp., Oklahoma City, Okla.
4. A colored film of the construction of the Tennessee Gas and Transmission Company line.
5. A colored film of the construction of the Canol line.
6. Solid Absorbent Dehydration Plants. Carl V. Spengler, T. F. Prichard & Co., Pittsburgh, Pa.
7. Relative Performance and Cost Data for Angle and Horizontal Compressing Units.

PRODUCTION AND STORAGE SYMPOSIUM

Presiding, L. T. Potter, Chairman, Production

R. H. Hargrove

E. J. Boothby

H. D. Hancock

Walter C. Beckjord

E. Holley Poe

W. A. Dougherty

L. V. Watkins

Fred R. Rauch

W. M. Deaton

L. T. Potter

and Storage Committee, A.G.A.; Superintendent of Production, Lone Star Gas Company, Dallas, Texas.

1. Review of Certain Storage Projects
   a. Goleta Storage Project
   b. Storage in the Appalachian Area
2. Windowed Cell for Observing Hydrocarbon Phases Under Variable Pressures. Kenneth Eilberts, Physical Chemist, U. S. Bureau of Mines, Bartlesville, Oklahoma.
4. Corrosion of Equipment in High Pressure Gas Wells. T. S. Bacon, Research Engineer, Lone Star Gas Company, Dallas, Texas

There will also be open parallel sessions of the Accounting Committee under the chairmanship of Leith V. Watkins, secretary-controller, Panhandle Eastern Pipe Line Company, Chicago, Illinois; and the Large Volume Sales Committee under the chairmanship of J. H. Gumz, manager, commercial and industrial sales, Pacific Gas and Electric Company, San Francisco, California.

F.P.C. Releases Natural Gas Company Statistics

STATISTICS of Natural Gas Companies —1944," a report containing financial and operating information on 116 gas companies which reported an aggregate book investment in gas plant of $1,970,499,175 as of December 31, 1944, has been released by the Federal Power Commission.

The information in the new publication was taken from annual reports of natural gas companies to the F.P.C. for the year 1944. The companies for which data are shown are limited to those which, for administrative purposes, have been determined to be natural gas companies within the meaning of the Natural Gas Act. The compilation does not contain information on all such companies, however, as the jurisdictional status of certain companies remains in question.

The report contains data as to balance sheet; income and earned surplus accounts; gas operating revenues, customers, and sales; gas operating expenses; gas plant investments; gas account; gas reserves; and field and transmission systems.

"Statistics of Natural Gas Companies—1944" is priced at $1.00 a copy and may be obtained only from the Federal Power Commission, Washington 25, D. C., to which all orders should be addressed enclosing remittance.

Conversation

● Conversation is but carving;
Give no more to every guest
Than he is able to digest;
Give him always of the prime
And but a little at a time;
Give to all but just enough,
Let them neither starve nor stuff,
And that each may have his due,
Let your neighbor carve for you.

Sir Walter Scott

Gas Pipe Line Company Bids $40,000,000 For War-Built "Inch" Arteries

THE Federal Power Commission disclosed March 18 that Trans-Continental Gas Pipe Line Co., of Longview, Tex., had offered $40,000,000 for three great pipe lines built by the government to move gasoline and oil during the war. (Associated Press Washington report.)

The F. P. C. said Trans-Continental also proposed to spend another $40,000,000 to convert the three pipe lines, the Big Inch, Little Big Inch and Southwest Emergency, to transportation of natural gas to Pennsylvania, New Jersey and New York. Total cost to the government of the three lines approximated $152,000,000, the F. P. C. said.

Trans-Continental, the commission reported, said its $40,000,000 purchase offer was made to the War Assets Corporation. The F. P. C. described Trans-Continental as a "recently organized" Texas corporation. W. A. C. said the company's offer was one of several under consideration.

In addition, Trans-Continental has applied to the F. P. C. for authority to convert and use the lines for natural gas transportation if W. A. C. will sell or, if it is unable to buy them, to construct two Texas-to-New Jersey lines at a cost of $80,000,000 each.

First of these proposed alternate lines, the F. P. C. said, would approximate the route of the Big Inch, a 1,340-mile line from Longview to Linden, N. J. The second would also be twenty-six-inch pipe which would "loop the original line." The company spoke of constructing it "later as the market develops in the Eastern area," the commission said.

The Southwest Emergency is a feeder line for crude oil from southwest Texas to the initial station of the Big Inch at Longview.

Trans-Continental's application said the gas it proposes to move East would be obtained from reserves in Harleton, Panola, Jefferson and south and southwest Texas oil fields.

Trans-Continental, the F. P. C. said, stated it has options for the purchase of 200,000,000 cubic feet of natural gas daily and is negotiating for options on the purchase of additional gas sufficient to supply the maximum capacity of the line for thirty years.

Natural Gas Investigation Continues

THE sixth of the series of hearings on the Federal Power Commission's Natural Gas Investigation began in Chicago on February 19, lasting over two weeks.

State and city officials, and large industrial natural gas consumers from the states of Illinois, Iowa, Minnesota, Wisconsin, Indiana, Michigan and Nebraska, totaling more than 85 witnesses, gave testimony indicating that these consuming states want more natural gas with no further Federal control.

Warren Henry, acting chief engineer of the Illinois Commerce Commission, testified for his state that heavy industrial loads are necessary to maintain reasonable rates for domestic gas.

The states of Indiana and Illinois through their spokesmen have advocated a regulated control of the direct sales of gas off pipe lines.

Witnesses from Minnesota, Indiana, Illinois and Iowa were all in accord on having no restriction on the "end use" of natural gas and no restriction on its exportation from producing states. They contend that natural gas is needed for the economic development of their states.

The state of Indiana through its Public Service Commission has already invoked its alleged state powers to control the rates for direct sales off pipe lines and witnesses testified that such rates should be controlled.

Various witnesses for industries in all the consuming states appearing at the hearing asserted that the end use of gas should not be controlled, competition should be free, and the customer should make his own choice of the fuel he desires.

Spokesmen from Minnesota pointed out that the state's iron ore reserves were unrestricted and no attempt was ever made by that state to regulate its end use. They contended that natural gas reserves in other states should be similarly treated.

A great many witnesses, including mayors from small cities or their spokesmen, presented resolutions opposing any restriction on the end use of gas.

The next hearing is posted for Charleston, West Virginia, beginning April 1.

Proposes 400-Mile Gas Line to Kansas City

THE Mid-Continent Gas Transmission Company, Wilmington, Delaware, has filed with the Federal Power Commission an application for authority to construct and operate a 400 mile 26-inch main transmission pipe line from the Hugoton Gas Field beginning near Liberal, Kansas, and extending to Kansas City, Missouri, with construction to be completed by November 1946. The initial cost of the proposed line, including gathering lines, field compressor units and auxiliary equipment, is estimated at $25,620,000. The company plans to finance the project through the sale of $15,000,000 of first mortgage 3¼ per cent bonds, $6,000,000 of 4 per cent serial notes or debentures and the balance through the sale of common stock.

Examining a gas house heating unit at the opening of the Home Planning Bureau of the New York Utility are, left to right: John Kohout, president of the company; H. Vinton Potter, New Freedom Kitchen, director; Edward Drew, assistant director, A. G. A. Promotional Bureau; John W. West, Jr., assistant managing director, A. G. A., and H. Carl Wolf, managing director

Home Planning Bureau Set Up by N. Y. and Richmond Gas Co.

SINCE the opening ceremony on February 20, the newly established Home Planning Bureau of the New York and Richmond Gas Company, Stapleton, N. Y., has met with an immediate public response. Starting with an initial attendance of 150, C. A. Kennedy, sales manager, reports that an average of 20 interested people have been interviewed daily with a peak of around 75 on a Saturday morning.

"Two out of three of all interviewed," Mr. Kennedy states, "are seriously interested in building or re-equipping their homes. A large number are interested in the complete all-gas home and all are interested in getting facts on modern gas appliances."

One of the first of its kind in the country, the bureau follows the "Quick-Getaway Plan" of the Surface Combustion Corporation which was recently carried to the country in a series of meetings sponsored by the Residential Gas Section of the American Gas Association.

H. Carl Wolf, managing director of the Association, cut the ribbon at the opening ceremony, which was attended by civic and business leaders.

The bureau is designed to furnish the prospective home builder all the information he needs, including aid in planning, site selection, design, installation of equipment and financing.

Considerable interest has been shown in the photo gallery which pictures 30 homes and includes plans for them. This feature of the exhibit was arranged in conjunction with Staten Island architects.

Island builders, banks and mortgage companies are also cooperating in the project, furnishing information and material which may be of use to the prospective home owner.

The bureau, according to Richard A. Plata, director, is also of value to those planning to remodel or re-equip their homes.

Mr. Plata has scheduled a series of forums on subjects of interest to home planners, at which authorities on home construction, decoration, financing and other subjects will speak. He is also planning a servicemen's day, at which speakers will discuss the GI Bill of Rights and answer questions from servicemen in reference to the problems of home planning, building and financing.

The exhibit is open to the public daily, from 9 A.M. to 5 P.M., with the exception of Saturdays, when the hours are 9 A.M. to noon.

View of the Home Planning Bureau set up by the New York and Richmond Gas Company. It follows suggestions incorporated in the "Quick-Getaway" Plan of Surface Combustion Corp.

Russia Has Vast Coal Oil and Gas Reserves

IN addition to large coal reserves, Russia has ample oil and natural gas resources, Eddy Gilmore reported in an Associated Press dispatch from Moscow, dated March 14, from which the following was taken.

Before the war the Soviet Union was second in world production and consumption of oil, with reserves of upwards of 3,500,000,000 tons. Oil would seem to be everywhere in vast Russia. Heavy greasy films cover many lakes in the north and peasants have to make no more effort than to dip a dish cloth in it and wring it out.

New refineries are springing up. The Soviet Union purchased equipment for five refineries from the United States during the war. Two of these were completed in a single year, one in the second year and the other two are almost finished. The latest refinery to start production is at Krasnovodsk.

The U. S. S. R. has natural gas to burn. It is playing an ever more important role in the country's life. The biggest single piece of construction in this field is a 528-mile pipe line bringing natural gas from Saratov, on the lower Volga, to Moscow. It is big enough to supply the capital with 1,350,000 cubic feet of gas. One of the important effects of this line when it goes into operation almost any time now will be the elimination of wood as a means of heating. Large numbers of Moscow's houses and buildings use wood which is difficult to transport.

Rochester To Purchase Natural Gas

ROCHESTER Gas and Electric Corporation announced March 6 that it has contracted for the purchase of natural gas to replace enriching oil now used in its water gas production. There will be no change in the thermal value of the gas supplied in Rochester and coal gas will continue to supply the base load according to A. M. Beebee, vice-president in charge of gas operations.

"In the new plan," Mr. Beebee said, "natural gas will be used in place of oil to bring the heating value of the water gas up to the necessary thermal standard. The natural gas will primarily come from Texas, where there are ample reserves to enable the company to contract for an 18-year supply. It will come here by way of the Cabot pipe line, which formerly supplied natural gas to some Rochester industrial plants, a service abandoned in 1942.

"The contract for the natural gas is with the New York State Natural Gas Company, which recently purchased the old Cabot line to Rochester and which buys most of its gas from the Hope Natural Gas Company at the Pennsylvania-West Virginia state line, which in turn buys the major share of its gas from the recently installed Tennessee Line from Texas to West Virginia.

"It is hoped to be able to install the necessary pipe line connection and equipment so that the natural gas can be made available at the plant before the heavy gas loads develop next fall. Initial annual purchases will be 750 million cubic feet (the equivalent rate of 1,400,000,000 cubic feet of manufactured gas) as compared with 7 billion cubic feet produced by the company in 1945, or about 20 per cent."

Electronic Cooking Myth Punctured

PERHAPS the first authoritative report on the possibilities of "electronic" cooking appears in an article by J. C. Sharp, vice-president in charge of engineering, Edison General Electric Appliance Co., Chicago, in the March 1 issue of *Electrical Merchandising*. Describing experiment by "Hotpoint" engineers with the operation of the first electronic range, it concludes that such ranges have "a doubtful future for domestic use."

Some of the results of recently-completed studies were given as follows:

An electronic range with only one unit for cooking would retail at more than $1,000.

While standard ranges boil, stew, fry, roast, bake and broil all foods with results that please the housewife, most foods cooked in the electronic unit are "different" tasting from conventionally-prepared foods.

Meat cooked by electronics is heated internally and, "the outside, not being surrounded by high temperature air, does not become crusted or browned. The flavor, appearance and texture are so different from those qualities of familiar foods that the meat is not palatable to the consumer."

In an accompanying editorial note, *Electrical Merchandising* says:

"Up to now most devices to apply electronic heat have been funny-looking, laboratory specimens. This one, built at Hotpoint, is on a scale comparable to the average domestic range. It will operate on a similar wiring setup and occupies the same amount of space.

"Under laboratory conditions, its performance on foods that ordinary households consume was carefully timed and charted. The cost of construction was estimated.

"Net result was to puncture the 'wonder boy' myth that has sprung up around this form of cooking. Today's conventional electric range looks and is a bargain and produces better tasting food.

"All the experts would allow was that such a range might have a future in commercial application, such as in chain restaurants where meals can be prepared in advance and frozen and where waste and spoilage can be avoided by quick heating of food as it is needed. Outside of this, the application of electronic heat so far seems to belong to the laboratory rather than to the kitchen."

200 Research Projects Proposed by Employees

APPROXIMATELY 200 research projects covering a wide range of subjects have been suggested by employees of The Brooklyn Union Gas Company in response to an announcement a year ago by Clifford E. Paige, president of the company and past president of the American Gas Association.

Subjects varied from a proposal for a study of low temperature gasification of powdered coal to the simple suggestion that efforts be directed toward the development of a more glamorous gas toaster for home use.

Ideas forwarded to A. G. A. include one for a cable connection between meter and a dial to be installed on the outside of a house which would make it unnecessary for a meter reader to enter the customer's premises. Others related to improvements in appliances, a suggestion that the five-light gas meter be redesigned to make repairs less costly, and a proposal, that the chemical market be surveyed as a first step toward finding better markets for by-products.

Southern Meeting Attracts Large Audience

MORE than 800 persons attended the thirty-fifth annual meeting of the Southern Gas Association, March 20-22, at the Buccaneer and Galvez Hotels which was one of the most successful ever sponsored by the Association. Under the presidency of Frank S. Kelly, Jr., of the Arkansas-Louisiana Gas Co., Shreveport, an informative program of national interest was presented.

Dean A. Strickland, general sales manager, United Gas Corp., Houston, Texas, was elected president for the coming term. Other new officers are: first vice-president—W. L. Woodward, president, Zenith Gas System, Alva, Okla.; second vice-president—W. H. Ligon, president, Nashville Gas and Heating Co.; treasurer—L. L. Dyer, controller, Lone Star Gas Co., Dallas.

New directors are Streuby L. Drumm, New Orleans Public Service Inc.; D. W. Reeves, Oklahoma Natural Gas Co., Tulsa; W. F. Wright, Lone Star Gas Co., Dallas; L. L. Baxter, Arkansas Western Gas Co., Fayetteville; R. O. Wheeler, Gulf States Utilities Co., Baton Rouge, La.; W. A. Green, Arkansas Power and Light Co., Jonesboro; and F. J. Evans, Evans Engineering Co., Birmingham, Alabama.

The newly appointed managing director, Robert R. Suttle of Austin, Texas, was introduced at the conference.

In addition to a one-day home service workshop, March 20, the meeting included sessions of the Sales, Operating, Industrial and Commercial, and Accounting Sections.

Featured speakers at the general sessions were R. H. Hargrove, first vice-president, American Gas Association; Clifford Johnstone, managing director, Pacific Coast Gas Association; Lyle C. Harvey, president, Gas Appliance Manufacturers Association; Charles C. Wine, chairman, Arkansas Public Service Commission and Warren Whitney, vice-president, National Association of Manufacturers. H. Carl Wolf, managing director, American Gas Association, spoke at the luncheon session, March 22, on the topic "A Parade of Progress." He gave a dynamic picture of developments in the gas industry's cooperative program.

In an address at the first general session entitled "Let's Look at the Record," Mr. Hargrove, who is vice-president and general manager, United Gas Pipe Line Co., Shreveport, reviewed the progress of the gas industry during the last decade. He pointed out that the gas industry is sixth in total investment in United States industries and that natural gas has advanced from 38 to 47 per cent of the total gas customers during the past ten years.

Following its great war record, Mr. Hargrove said, "the gas industry gained the respect and admiration of many others by its straight thinking, comprehensive postwar planning. It has gained further respect by the manner in which it formulated its research and promotional plan, raised the necessary funds and got underway. It has made still further progress by bringing together into one coordinated, alert progressive organization both the manufactured and natural gas groups."

He concluded: "Today we have, I am proud to say, a united industry, united in a purpose, in a program, and in a resolve for action. A look at the record will reveal a great past. With the organization, the tools, the will, and a unity of purpose, a record is being written of a great future."

New Market and Economic Research Committee

E. H. Eacker

RECOGNIZING the importance of further research in the marketing of gas service and appliances and in the economics of producing, transporting and distributing gas, the American Gas Association is organizing a special Committee on Economic and Market Research Needs under the chairmanship of E. H. Eacker, vice-president of the Boston Consolidated Gas Company.

As announced by President Everett J. Boothby, objective of this committee will be to review economic and market studies recently made or started by committees of the Association, particularly the Postwar Planning Committee, and to determine the needs of the industry for further marketing and economics research. Because the subject touches on many phases of the Association's work the membership will include the chairmen or representatives of the Manufactured and Natural Gas Departments, the Residential Gas, Industrial and Commercial Gas, and Technical Sections, and the Rate and Statistics Committees.

Mr. Eacker, spearhead of this activity, is a member of the A. G. A. Executive Board and is well versed in gas industry economics.

Midwest Personnel Executives Meet

INDUSTRIAL relations problems concerning the return to the forty-hour week were the chief subject discussed at the meeting of the Midwest Personnel Conference of the American Gas Association, held at the Phillips Hotel, Kansas City, on March 7.

Nearly a full attendance of the membership was achieved and the majority of those present reported on the current status of contract negotiations, other than wages, with extremely beneficial results. The need for foreman and supervisory training was emphasized and available material on this subject will be investigated and reported at the next conference.

H. D. Carmouche, general superintendent of the Houston Pipe Line Company and V. H. Luneborg, personnel manager, Arkansas Natural Gas Corporation, chairman and secretary, respectively of the A. G. A. Southwest Personnel Conference, presented a proposal of that group to hold a joint conference in the Fall which was unanimously approved. Possibilities of holding this joint conference in conjunction with the Industrial Relations School of the University of Oklahoma are being studied.

The next meeting of the Midwest Personnel Conference of the A. G. A. will be held at the Phillips Hotel, Kansas City, on June 6, it was announced by C. C. Jolley, personnel director, Natural Gas Pipeline Company of America, Chicago, who is chairman of the conference.

Range Makers Get Rise

A 5 per cent reconversion increase factor to be applied to manufacturers' present ceiling prices for domestic cooking and heating stoves, except electric models, was announced March 16 by the Office of Price Administration. At the same time O.P.A. announced that wholesalers are required to absorb 25 per cent and retailers 75 per cent of this manufacturers' price increase.

No change will be made by this action in the recently announced dollar-and-cent retail ceiling prices for new gas and electric cooking stoves. Under this action, all other types of domestic stoves—coal, wood, oil, gasoline, kerosene—will continue to sell in retail stores at the 1942 levels.

Texas-California Gas Line Hearing Set

THE Federal Power Commission has set April 8 for a further hearing in the consolidated proceedings on the applications of the El Paso Natural Gas Company, El Paso, Texas, Southern California Gas Company and Southern Counties Gas Company of California, both of Los Angeles, for authorization to construct and operate facilities to transport natural gas from Texas and New Mexico gas fields to the Los Angeles area.

Facilities proposed consist of construction and operation by El Paso of a 1000 mile 24- and 26-inch pipe line from Texas gas fields, from a point near Dumas in Moore County, Texas, to the Colorado River near Blythe, California. There, Southern California and Southern Counties propose to begin a 200 mile 26-inch connecting line to transport gas westward to Santa Fe Springs to connect with an existing line to Los Angeles.

New A. G. A. Members

GAS COMPANIES*

Consolidated Edison Co. of N. Y., Inc., New York, N. Y. (Clarence L. Law)

Menominee & Marinette Light & Traction Co., Milwaukee, Wisc. (C. E. Kohlhepp)

Public Service Corp. of Texas, Fort Worth, Texas (I. E. Horwitz)

City of St. Petersburg, St. Petersburg, Florida (Alex Speer)

MANUFACTURER COMPANIES*

Aladdin Heating Corp., Oakland, Calif. (S. W. Terry)

American Bldg. Equipment Co., Cleveland, Ohio (I. L. Resen)

C. L. Bryant Corp., Cleveland, Ohio (H. M. Robey)

Consolidated Vultee Aircraft Corp., Nashville, Tenn. (E. F. Dupuis)

Dahlquist Manufacturing Co., Inc., Somerville, Mass. (Lawrence C. Paul)

Folsom Co., The, Dallas, Texas (A. I. Folsom)

Hall-Neal Furnace Co., Indianapolis, Indiana (Fred S. Boone)

Kilbury Mfg. Co., Inc., Lawndale, Calif. (Paul D. Kilbury)

Linch Safe T. Heat Co., Burbank, Calif. (Dick R. Linch)

Lowell & Grayson Mfg. Co., Monrovia, Calif. (J. H. Grayson)

National Furnace Mfg. Co., Memphis, Tenn. (N. W. Wade)

Spartan Aircraft Co., Tulsa, Oklahoma (Maxwell W. Balfour)

United States Radiator Corp., Detroit, Mich. (R. F. Connell, Mgr.)

Valley Welding & Boiler Co., Bay City, Michigan (John W. Hebert)

Willoughby Machine & Tool Co., Willoughby, Ohio (H. R. Rogant)

INDIVIDUAL MEMBERS

F. J. Abbott, Gas Consumers Association, Boston, Mass.

D. M. Baker, The East Ohio Gas Co., Cleveland, Ohio

B. E. Bartholomae, Equitable Gas Co., Pittsburgh, Pa.

Harry L. Beck, Southern California Gas Co., Los Angeles, Calif.

Harold E. Bisbort, Connecticut Light & Power Co., Waterbury, Conn.

Oscar H. Boothe, City of Richmond, Richmond, Va.

E. C. Bruce, Coast Counties Gas & Electric Co., Santa Cruz, Calif.

Victor M. Bunyan, The Geelong Gas Co., Geelong, Victoria, Australia

J. S. Cage, United Gas Corp., Monroe, Louisiana

J. H. Caward, Southern California Gas Co., Los Angeles, Calif.

Andrew Christophorides, Athens Municipal Gas Co., Athens, Greece

Leon E. Clancy, Detroit-Michigan Stove Co., Detroit, Mich.

*Names in parentheses are Company Delegates of the American Gas Association.

A.G.A. At Your Service

Comprehensive program of Association activities on a national scale provides many benefits to members

Following organization of a Membership Committee consisting of outstanding industry executives under the chairmanship of J. N. Greene, president, Alabama Gas Company, Birmingham, announced last month by President E. J. Boothby, a brief outline of the scope of the Association's activities was prepared for distribution to interested companies. While it would take many pages to give a complete picture of the comprehensive program by which the A. G. A. serves the gas industry, this summary clarifies the nature of the activities conducted for the benefit of company members.

The American Gas Association, truly representative of the gas industry, is concerned with all matters of interest to the gas industry. The Association is a fact-finding, coordinating group sustained and directed by individuals and companies of the gas industry. The organization of the Association includes two departments—the Natural Gas Department, to handle matters of special interest to natural gas companies; the Manufactured Gas Department, to handle activities of special interest to manufactured and mixed gas companies; and a number of Sections and General Committees which cover activities of common interest to all branches of the gas industry.

The Association's normal activities have been greatly expanded by the substantial industry funds, the National Advertising Fund and the Research and Promotional Fund. The existence of the Association made possible the establishment and operation of these funds with no curtailment of normal functions.

The activities of the Association are varied and numerous. The following is an attempt to summarize its major work:

1. The American Gas Association is a source of exhaustive information and assistance on all phases of gas company operations. In addition to its own staff of specialists, committee members and other qualified members are consulted to make available the most complete information on specific problems to member companies.

2. It conducts fundamental and applied research in the fields of production, distribution and utilization of gas. Some of the research projects are carried out in member companies' property or in the A. G. A. Testing Laboratories; other projects are sponsored at universities or institutes qualified to carry out these investigations. The research program is designed to answer current questions and to provide a basis for future development of the gas industry by fundamental scientific investigations and by applied engineering knowledge. Results of the research are made available to the industry as projects are completed.

3. The American Gas Association Testing Laboratories and committees have developed standards, adopted as official American Standards, for the testing and certification of gas appliances which have made gas appliances of higher efficiency, greater safety and longer life available to the public.

4. The Association conducts an extensive national cooperative advertising program to promote public acceptance of gas as a modern, efficient fuel for household, industrial and commerical purposes.

5. It maintains many committees, made up of specialists in their particular fields, on all phases of gas company operation. The informative results of committee work are being made constantly available to the members.

6. It prepares campaigns for the sale of domestic, commercial and industrial gas appliances and equipment.

R. E. Clarke, Standard Oil Co. of Calif., San Francisco, Calif.

Warren A. Cook, Zurich Insurance Companies, Chicago, Ill.

Ross N. Cox, Northern Natural Gas Co., Omaha, Nebr.

Lee Corn, The East Ohio Gas Co., Massillon, Ohio

Thomas E. Cross, Jersey Central Power & Light Co., Long Branch, N. J.

James D'Entremont, Gas Consumers Association, Providence, R. I.

Andrew Dolfini, Norwalk Valve Co., So. Norwalk, Conn.

Joseph Doll, Milwaukee Gas Light Co., Milwaukee, Wisconsin

William L. Dutton, Union Gas. Co. of Canada, Ltd., Chatham, Canada

John H. Emery, Roberts & Mander Stove Co., New York, N. Y.

Walter B. Eshleman, Southern Counties Gas Co., Los Angeles, Calif.

Charles E. Farrington, Rockland Light & Power Co., Middletown, N. Y.

E. V. Fineran, Washington Gas Light Co., Washington, D. C.

L. B. Fox, Socony Vacuum Oil Co., Inc., New York, N. Y.

Charles E. Gallagher, The East Ohio Gas Co., Cleveland, Ohio

Joseph A. Gallagher, Public Service Elec. & Gas Co., Newark, N. J.

H. C. Givan, Jr., Equitable Gas Co., Pittsburgh, Pa.

A. R. Grant, Southern California Gas Co., Los Angeles, Calif.

John H. Grayson, Lowell & Grayson Mfg. Co., Monrovia, Calif.

R. D. Grayson, Lowell & Grayson Mfg. Co., Monrovia, Calif.

E. K. Gwynn, Pacific Gas & Electric Co., Salinas, Calif.

H. C. Hammond, Southern California Gas Co., Los Angeles, Calif.

John E. Heyke, Jr., The Brooklyn Union Gas Co., Brooklyn, N. Y.

Winston E. Himsworth, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Mrs. Beulah Howell, Gas Age, Robbins Publishing Co., New York, N. Y.

Erwin L. Husman, A. O. Smith Corp., Fort Wayne, Ind.

Richard E. Jacobs, Southern California Gas Co., Los Angeles, Calif.

J. Albin Johnson, Ruud Manufacturing Co., Long Island City, N. Y.

Paul G. Kepner, Lowell & Grayson Mfg. Co., Monrovia, Calif.

A. Haines Kline, Public Service Elec. & Gas Co., Newark, N. J.

Walter H. Kurdelski, Michigan Consolidated Gas Co., Grand Rapids, Mich.

Raymond H. Lohr, The East Ohio Gas Co., Ravenna, Ohio

W. H. Loving, Washington Gas Light Co., Washington, D. C.

Andrew J. Maloney, Washington Gas Light Co., Washington, D. C.

Oral R. Marvel, Southern California Gas Co., Los Angeles, Calif.

Harold L. May, Palo Alto Municipal Utilities, Palo Alto, Calif.

R. T. McCrum, Equitable Gas Co., Pittsburgh, Pa.

Max A. Minnig, Continental Carbon Co., Amarillo, Texas

Howard J. Monroe, Milwaukee Gas Light Co., Milwaukee, Wisc.

John Mooney, Standard Gas Equipment Corp., Orlando, Florida

Joseph P. Mulvihill, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Thomas J. Noonan, The East Ohio Gas Co., Cleveland, Ohio

L. Bert Nye, Jr., Washington Gas Light Co., Washington, D. C.

Frank W. Patterson, Canadian West. Nat. Gas, Lt., Heat & Pr. Co., Ltd., Alberta, Canada

Delbert W. Robinson, Community Public Service Co., Fort Worth, Texas

S. R. Robinson, San Diego Gas & Electric Co., San Diego, Calif.

Cecil A. Runyan, The Albion Gas Light Co., Albion, Michigan

Leslie B. Sanders, Jr., Lever Brothers Co., Cambridge, Mass.

Charles E. Schoene, The Laclede Gas Light Co., St. Louis, Mo.

John C. Sims, The Brooklyn Union Gas Co., Brooklyn, N. Y.

A. E. Stack, Washington Gas Light Co., Washington, D. C.

Walter W. Stake, A. O. Smith Corp., New York, N. Y.

Paul Stark, Indiana Gas & Water Co., Inc., Indianapolis, Ind.

Clifford A. Stockhoff, Servel, Inc., San Francisco, Calif.

A. T. Stronz, The East Ohio Gas Co., Girard, Ohio

Leroy M. Sweet, The Laclede Gas Light Co., St. Louis, Mo.

J. H. Thacher, Standard Oil Co. of California, San Francisco, Calif.

A. T. Torgeson, Northwest Cities Gas Co., Pendleton, Oregon

Leonard H. Verschoor, Michigan Consolidated Gas Co., Grand Rapids, Mich.

James H. Waddle, McKamie Gas Cleaning Co., Magnolia, Arkansas

William W. Wallace, Servel, Inc., San Francisco, Calif.

W. D. Webb, G. S. Blodgett Co., Jacksonville, Florida

Frank E. Weeks, Gas Consumers Association, San Francisco, Calif.

Calvin E. Williams, A. O. Smith Corp., Miami, Florida.

Dwight H. Woods, Nashville Gas & Heating Co., Nashville, Tennessee

John S. Wright, Milwaukee Gas Light Co., Milwaukee, Wisconsin

D. J. Yearout, Coast Counties Gas & Elec. Co., Santa Cruz, Calif.

7. It advises member companies of government orders, rulings and pronouncements directly affecting gas company operations, significant legislation and court and commission decisions; aids its member companies to sell gas to government agencies for use in housing, developments and buildings; and maintains a Washington office to assist in these efforts.

8. The Association maintains a Statistical Bureau which collects, collates and distributes statistics of the gas industry to the daily press, financial publications, government bureaus and member companies of the Association.

9. It prepares and disseminates through a Publicity Bureau to newspapers, press services and magazines, news and publicity for the advancement of the gas industry. This Bureau also supplies member companies with ideas and information for local publicity purposes.

10. It publishes a monthly magazine—free to members—which reviews activities of the Association, includes papers on specific phases of gas company operations, news items, etc. Also issues bulletins, news letters, reports, proceedings of annual conventions and of conferences, technical manuals, approved appliance lists and a large amount of other informative printed matter for the benefit of member companies.

11. It maintains a clearing office of information on home service work directed by a qualified home economist.

12. It sponsors regional sales conferences in the domestic field at appropriate intervals and at strategic points for the promotion of commercial and industrial sales.

13. It conducts technical conferences on the problems of production, transmission, distribution and utilization of gas.

14. It conducts conferences on all phases of accountancy applicable to the operation of a gas company.

15. It promotes safety within the gas industry as well as in all applications of gas in the home and industry.

16. The Association holds national conventions with exhibits of the latest gas appliances and equipment at which company representatives meet, get acquainted, exchange information and hear speakers of national interest.

17. It has developed and maintains, under the supervision of a trained librarian, a complete and up-to-date file and library on the subject of gas. Their contents and the services of the librarian are available to the membership.

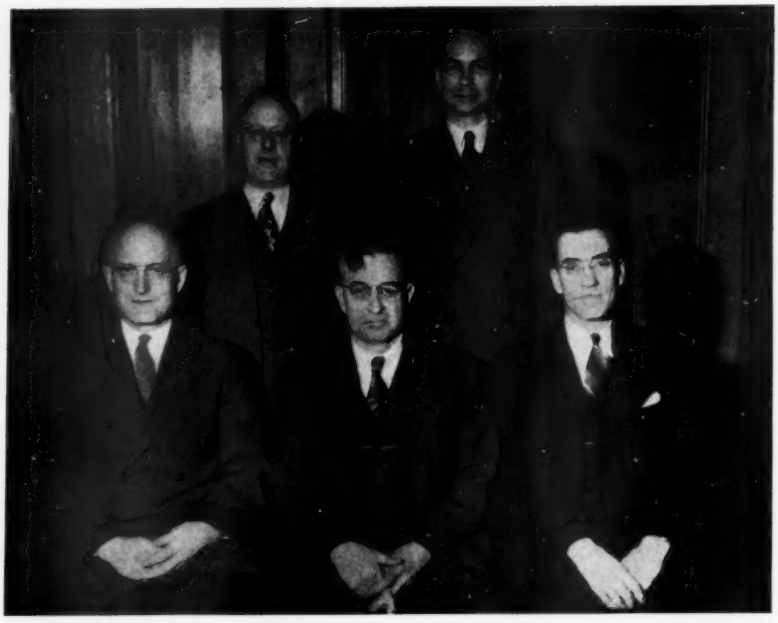
18. It maintains a rate reporting service which includes all gas rate schedules for communities in the United States and its possessions, Canada and Newfoundland.

19. Realizing the importance of state and regional gas associations as vital parts of the organized gas industry in their respective spheres, the American Gas Association endeavors to cooperate with them to the end that all gas organizations may serve the gas industry most effectively.

20. The American Gas Association cooperates with other organizations on matters of importance to the gas industry such as the American Standards Association on its Project Z-21 Standards for Gas Appliances, Project A-52 Building Code, etc.; National Fire Protection Association on its Committees on Gases, Ovens and Furnaces, and Air Conditioning Standards; National Safety Council, Building Officials Conference; Chamber of Commerce of the United States; National Industrial Conference Board, Edison Electric Institute, American Transit Association and many others.

21. It has always maintained the closest possible contact with the gas industry in Canada and foreign countries.

22. The American Gas Association is directed in all of its activities by an Executive Board fully representative of all components of the gas industry.



1946-47 N. E. G. A. Officers: Front row l. to r.: James A. Cook, 1st vice-president (Lynn Gas & Electric Co.); L. E. Knowlton, president (Providence Gas Co.); Edward G. Twobey, 2nd vice-president (Worcester County Electric Co.). Rear Row: Otto Price, treasurer (Boston Consolidated Gas Co.); Clark Belden, clerk (Exec. Sec.)

New England Gas Association Holds Annual Business Conference

BEARING out its record as one of the nation's most vigorous and progressive regional trade associations, the New England Gas Association returned to its prewar annual business conference with a fast-moving, comprehensive program of events March 21-22 at the Hotel Statler, Boston. Operating on the principle that "New Problems Mean New Opportunities," the Association's program committee, headed by E. H. Eacker of Boston, placed a wealth of valuable material before the hundreds of eastern gas men who attended.

Highlights of the N.E.G.A.'s activities and progress through the war and reconversion periods were presented by President David S. Reynolds, vice-president, Boston Consolidated Gas Co., and Clark Belden, executive secretary of the Association. National gas associations were represented on the program by Everett J. Boothby, president, American Gas Association; Lyle C. Harvey, president, Gas Appliance Manufacturers Association; D. A. Hulcy, chairman, A. G. A. Promotional Committee; Edwin L. Hall, secretary-coordinator, A. G. A. Gas Production Research; Lillian P. Dunbar, chairman, A. G. A. Home Service Committee and also chairman, N.E.G.A. Home Service Educational Committee.

L. E. Knowlton, engineer, Providence Gas Company, and past chairman, A. G. A. Technical Section, was elected president of the New England Gas Association for the 1946-1947 term. Other new officers named at the meeting are: first vice-president—J. A. Cook, general manager, Lynn Gas & Electric Co.; second vice-president—E. G. Twohey, assistant district manager, Worcester County Electric Co.; treasurer—Otto Price, vice-president, Boston Consolidated Gas Company. Mr. Belden was re-elected clerk.

Five divisional chairmen were selected as follows: Accounting—F. S. Pickford, The Hartford Gas Co.; Industrial—C. E. Hebert, Lynn Gas & Electric Co.; Manufacturers—A. McW. Wolfe, American Meter Co.; Operating—S. F. McCallister, general superintendent, Manchester Gas Co.; Sales—J. A. Hiller, Portland Gas Light Company.

The Home Service Group elected the following officers: chairman—Susan A. Mack, Boston Consolidated Gas Co.; vice-chairman—Doris Connors, Haverhill Gas Light Co.; secretary-treasurer—Elizabeth Bullis, Suburban Gas & Electric Co., Revere.

Feature of the meeting was a labor relations forum, participated in by outstanding educators from Harvard University, M.I.T., and Boston University, and directed by Thomas G. Dignan, president, Malden and Melrose Gas Light Company.

A home service breakfast was held Friday morning, March 22, under the leadership of Susan A. Mack, chairman, N.E.G.A. Home Service Group.

The Boston Consoldiated Gas Company's radio show "Quizzing the Wives," which leads Boston programs in listenership rating, introduced by J. J. Quinn, was one of the high spots of the conference.

Convention Calendar

APRIL

1-2 •Liquefied Petroleum Gas Association, Atlantic City, N. J.
1-3 •Meeting of Electric and Gas Industry Accountants, Netherland Plaza Hotel, Cincinnati, Ohio
2 •Natural Gas Investigation, Charleston, West Va.
8-10 •Mid-West Gas Association, St. Paul, Minn.
11-12 •A. G. A. New York-New Jersey Sales Conference, Westchester Country Club, Rye, N. Y.
11-13 •Interstate Oil Compact Commission, Mayo Hotel, Tulsa, Okla.
15-16 •A. G. A. Conference on Operation of Public Utility Motor Vehicles, The Stevens, Chicago, Ill.
15-17 •A. G. A. Distribution Conference, The Stevens, Chicago, Ill.
23-25 •Southwestern Gas Measurement Short Course, Norman, Okla.

MAY

6 •A. G. A. Spring Executive Conference, Cincinnati, Ohio.
7-8 •A. G. A. Natural Gas Department, Annual Spring Meeting, Hotel Gibson, Cincinnati, Ohio
9-10 •Indiana Gas Association Annual Meeting, French Lick Springs, Indiana.
10-11 •Gas Meters Association of Florida-Georgia, General Oglethorpe Hotel, Savannah, Ga.
21-23 •Pennsylvania Gas Association 38th Annual Meeting, Galen Hall, Wernersville, Pa.
22-23 •Natural Gas and Petroleum Association of Canada, Windsor, Canada
30-31 •Gas Appliance Manufacturers Association Annual Meeting, Edgewater Beach Hotel, Chicago, Ill.

JUNE

3-5 •A. G. A. Joint Production and Chemical Conference, Hotel Pennsylvania, New York, N. Y.
4-7 •The Institution of Gas Engineers, Annual Meeting, London.
6 •A. G. A. Mid-West Personnel Conference, Kansas City, Mo.
10-12 •Public Utilities Advertising Association, Atlantic City, N. J.
18-21 •Canadian Gas Association, 39th Annual Convention, Manor Richelieu Hotel, Murray Bay, Quebec
24-26 •American Home Economics Association, Public Auditorium, Cleveland, Ohio

OCTOBER

Wk. of 7th •American Gas Association, 28th Annual Convention and Exhibition, Atlantic City, N. J.

DECEMBER

2-6 •American Society of Mechanical Engineers, Annual Meeting, Hotel Pennsylvania, New York, N. Y.

Accounting Section

Tabulating Card Control of Meters

BY CHARLES D. OTCASEK

The East Ohio Gas Company, Cleveland, Ohio

THE mechanical control of meter movements outlined herein was designed to eliminate all manual meter controls formerly maintained by the bookkeepers, and to provide for the automatic reproduction of connect and disconnect states into meter cards, thereby eliminating the manual key punching of these states with the attendant possibilities of error.

The theory is that once a meter record card is established upon the purchase or transfer of a meter from another division the state on that meter for any subsequent movement of the meter is continually reproduced from proven punched information in the previously used meter card. In addition, the meter states are reproduced from the meter cards into the billing cards that are to be used to bill the customer, thereby eliminating further opportunity for errors due to manual key punching.

Presented by CUSTOMER ACCOUNTING COMMITTEE R. F. McGLONE *Chairman*

The basic records are two tabulating card files; an "Active File" consisting of a meter card for all meters on the lines, and an "Inactive File," consisting of a meter card for all meters in inventory at the various meter shop locations. These files are maintained by one clerk, known as the Meter Audit Clerk, who is responsible for the operation of the files, and who controls the flow of work between the meter card files and the bookkeeping and tabulating departments.

The following data is cut in each card in the "Active Meter" file:

1. Route and Account number
2. Kind of meter
3. Meter size
4. Meter number
5. Municipality code
6. Test tag date (year only)
7. Address of premise where meter is installed

This file is set up in route and account number sequence.

The following data is cut in each card in the "Inactive Meter" file:

1. Kind of meter

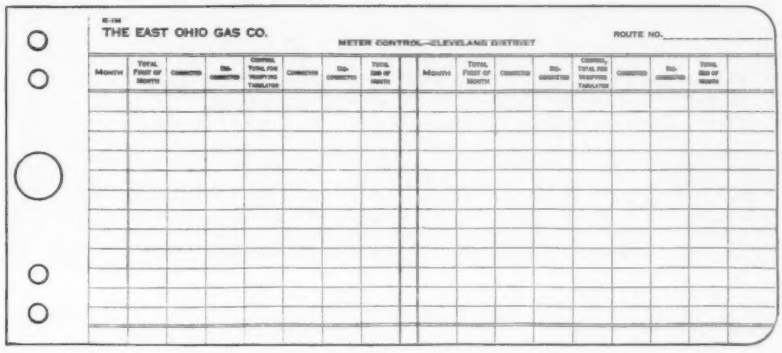
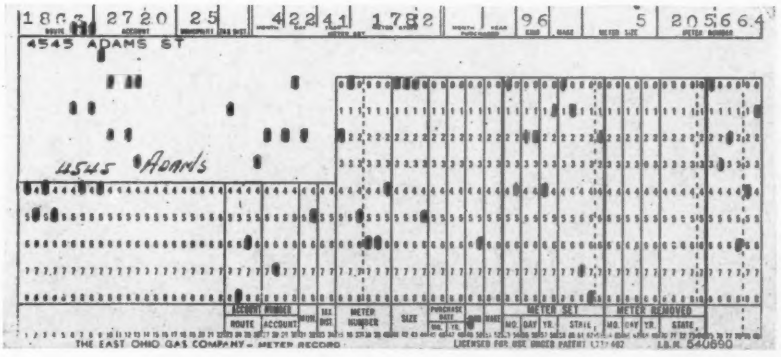


Exhibit I



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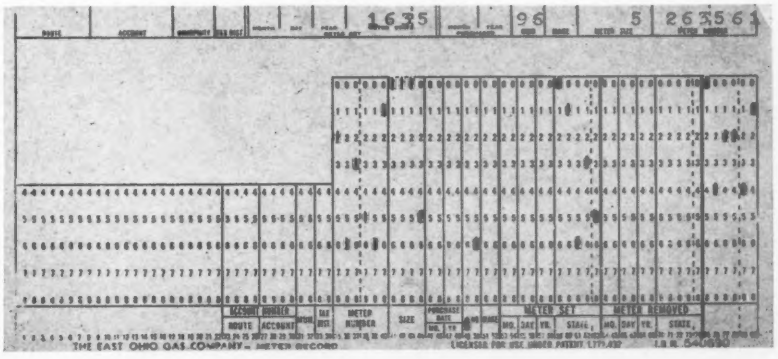

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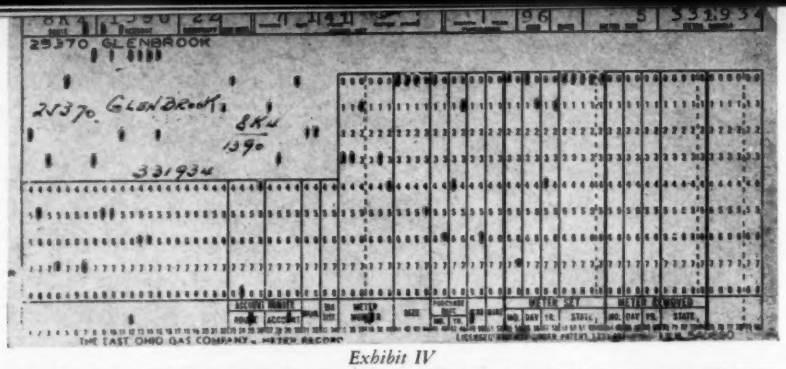


Exhibit IV

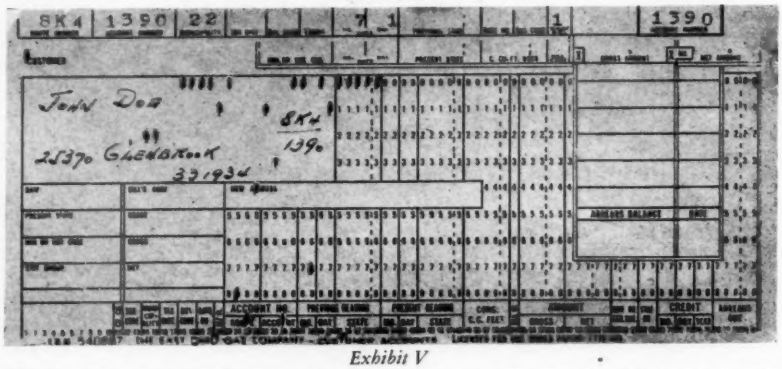


Exhibit V

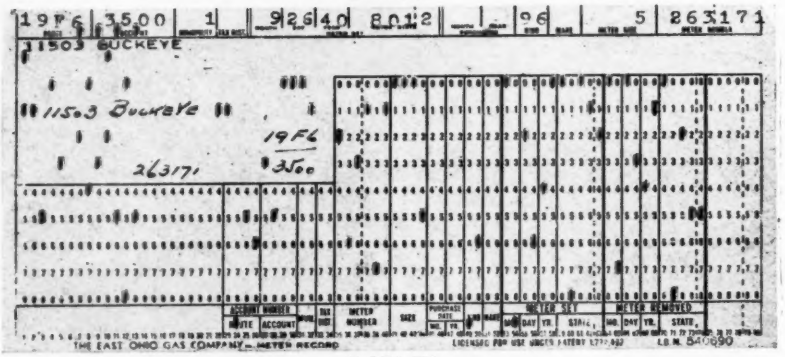


Exhibit VI

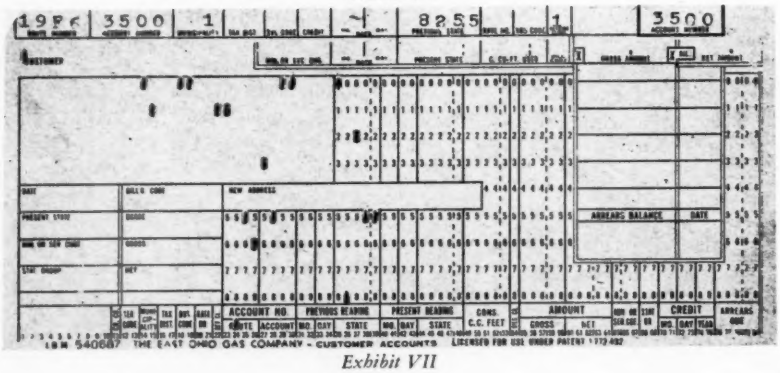
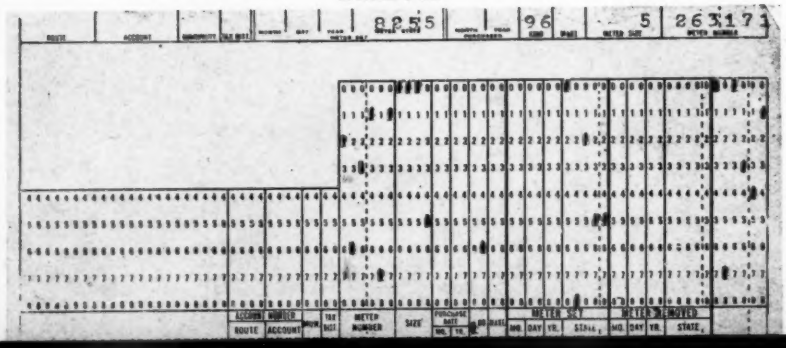


Exhibit VII

Exhibit VIII



2. Meter size
3. Meter number
4. Date of disconnection from line
5. Meter state*

This file is set up in meter number sequence by sizes and is added to by purchases, acquisitions by transfer from other divisions, or is depleted by sales, obsolescence, and disposition by transfer to other divisions.

Route Control

In front of each meter reading route book is a control sheet showing the total number (without regard to size) of meters in that book. (Exhibit I). This total is changed two times each month; once, as of the billing date and again as of the end of the month. These changes reflect the number of connected and disconnected meters within the route and the result is the revised total of meters as of billing date and as of the end of the calendar month.

A Suspense file of the meter cards currently moving from Active to Inactive and vice versa is maintained so as to segregate the cards needed for preparation of daily and monthly meter reports. It is from this source that daily listings of changes by routes are made for posting to the meter reading route book controls as explained above. This operation eliminates all controls for meters connected and disconnected, previously maintained manually within the bookkeeping units.

In addition to the above listings prepared for posting to meter books, other listings are prepared at the end of the month from the cards in the Suspense file as follows:

A. Connects and Disconnects are sorted by units, districts, and account number, and machine listed. This listing is forwarded to the meter audit clerk for use in setting up Meter Controls by Bookkeeping Units and for accounting for states of meters connected and disconnected.

B. The same cards are then sorted by municipalities and listed. This listing is likewise forwarded to the meter audit clerk for use in setting up meter controls by municipality.

Meter Controls

CLEVELAND DIVISION The meter audit clerk maintains and keeps a record of the number of meters by sizes charged to the Cleveland Division. This record shows:

a. Meters on Lines or Active Meters
b. Meters in Inventory or Inactive Meters
c. Total of both

All meters purchased or acquired during a month are added to the preceding month's total, while the number of meters junked or disposed of are deducted. The answer is the total number of meters by sizes charged to the Cleveland Division, both Active and Inactive.

A machine listing of the meter cards in the Inactive file is made at the end of each month. This listing is checked and compared with the inventory record submitted by the various

*NOTE: After repairs, a disconnected meter when re-set is connected at the same reading as when disconnected.

Accounting Conference

RESUMPTION of the series of joint accounting conferences sponsored by the American Gas Association and the Edison Electric Institute is scheduled for April 1-3 at the Netherland Plaza Hotel, Cincinnati. A comprehensive program will be presented under the joint chairmanship of E. F. Embree and H. H. Scaff. For a complete report on the meeting see the May A. G. A. MONTHLY.

shops following their physical count of meters in Shop.

These Inactive meter totals by sizes when deducted from the Cleveland Division totals give us the number of Active meters in the Cleveland Division.

BOOKKEEPING UNITS The meter audit clerk also maintains a record of the number of meters charged to each of the ten bookkeeping units. This total will agree with the total of Active Meters in the Cleveland Division. These unit totals are revised each month by the number of meters connected or disconnected. The revised totals constitute the control to which each unit balances its monthly statement of Active Meters. This count is merely a recapitulation of the end of month totals from the meter control in the front of each route book.

MUNICIPALITY The meter audit clerk also maintains a record (for report purposes only) of the number of meters in each municipality in the Cleveland Division. These totals are revised monthly by the number of current connects and disconnects.

Daily Routine

All meter orders which involve either a "connect," a "disconnect," or a "meter change" are forwarded to the meter audit clerk who maintains the two files of meter cards:

a. File of active meters (Exhibit II)
b. File of inactive meters (Exhibit III)

One of the daily duties of the meter audit clerk is to list from the meter orders by units, states connected and disconnected. These totals, posted to a central sheet, must at the end of the month agree with register of states connected and disconnected, by units, prepared from cards in the suspense file.

1. Connect Orders

Procedure for Meter Audit Clerk

a. Remove meter card from Inactive file. (Exhibit IV)
b. Compare connect state on order with the state shown on the meter card.
c. Attach meter card to order and forward to bookkeeping unit.

Procedure for Bookkeeper

a. Prepare new route sheet.
b. Prepare new customer advance card,

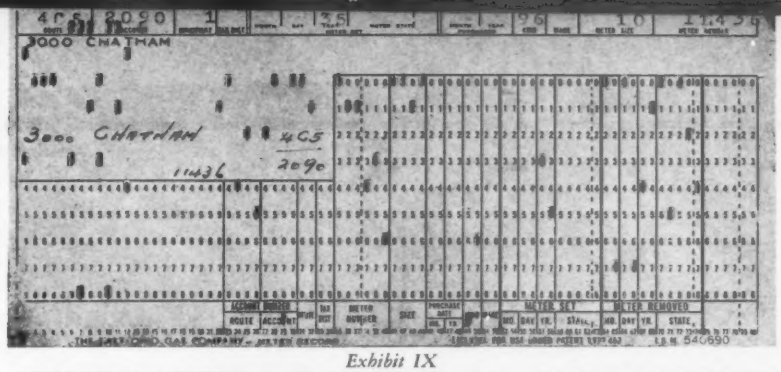


Exhibit IX

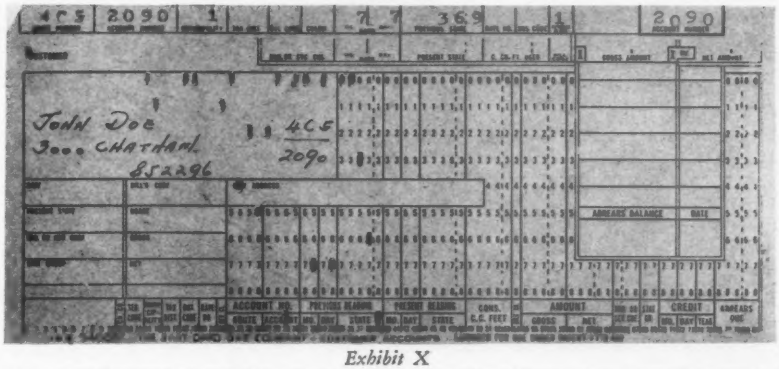


Exhibit X

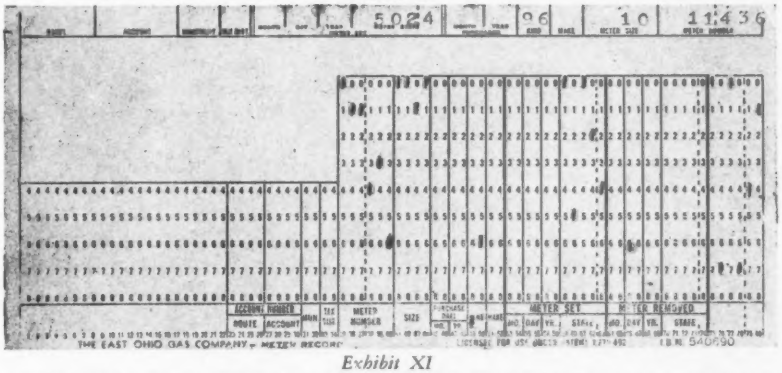


Exhibit XI

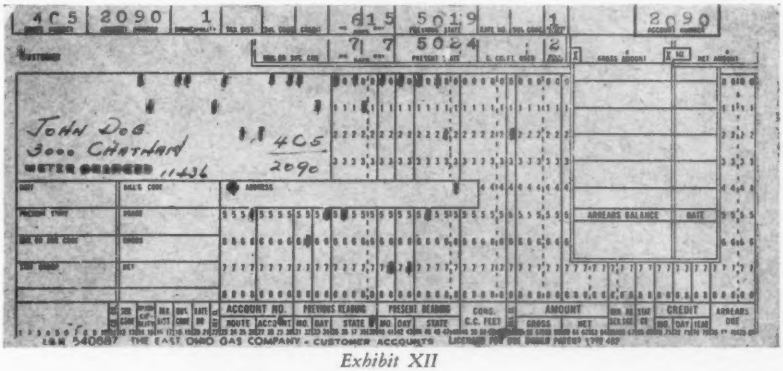
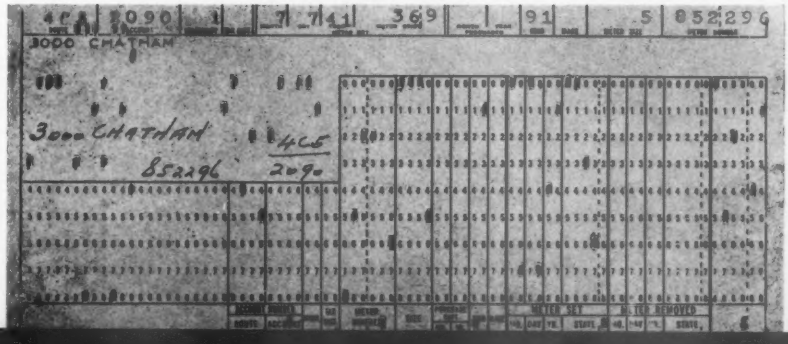


Exhibit XII

Exhibit XIII



writing customer's name and address on the card. (Exhibit V)

c. Write address on meter card.

d. Attach all cards to order and forward to tabulating room.

Procedure for Tabulating Room

a. Punch all necessary information into meter card from meter order.

b. Punch-verified by another clerk.

c. Reproduce from meter card into customer advance card all necessary information including connect date and state.

d. Meter card filed in Suspense File, customer card to Advance File.

2. Disconnect Order—Vacant Location

Procedure for Meter Audit Clerk

a. Remove meter card from active file (Exhibit VI)

b. Compare route, account number and meter number on order with punched active meter card.

c. Attach meter card to order and forward to bookkeeping unit.

Procedure for Bookkeeper

a. Work disconnect to Meter Route Sheet.

b. Destroy locked advance card. (Exhibit VII)

c. Attach meter card to order and forward to Tabulating Room.

Procedure for Tabulating Room

a. Punch disconnect date and state into meter card.

b. Punch-verified by another clerk.

c. Reproduce new meter card for inactive file. (Exhibit VIII)

d. Disconnected active card to suspense file.

3. Meter Changes

Procedure for Meter Audit Clerk

a. Remove Meter Card from Inactive File (Connect Meter) (Exhibit XIII)

b. Remove Meter Card from Active File. (Disconnect Meter) (Exhibit IX)

c. Same as "b" in Connect and Disconnect Routine.

d. Attach meter cards to order and forward to bookkeeping unit.

Procedure for Bookkeepers

a. Correct Meter Route Sheet.

b. Select proper Customer Advance Card. (Exhibit X)

c. Prepare new Customer Advance Card, writing customer's name and address on the card (Exhibit XII)

d. Write address on new meter card. (Exhibit XIII)

e. Attach all four cards to order and forward to Tabulating Room.

Periodic Inspection Program

The operating policy of the company calls for disconnection and inspection of all meters at periodic intervals depending on the kind of meter. All meters have a test tag soldered to them showing the year in which the meter was last inspected and repaired. This test year is reported on all meter orders for connecting and disconnecting meters, and is maintained in all the active meter cards in a two field column.

Periodically, as the various shops call for orders for meters to be changed under the test tag change program, the tabulating department selects the meter cards for the proper year, using a collator or sorter, and prepares a listing showing the following information:

Route and Account Number
Address or Meter Location
Size and Meter Number
Test Year

This listing is forwarded to our Teletype Department where a meter order for each meter on the list is teletyped to the proper shop.

A monthly report is also prepared for the Operating Department which gives them a current picture of the number of meters for any given test date year.

SALES PROMOTION PROGRAM

(Continued from page 148)

one for the natural gas territory and one for the manufactured gas territory because of the difference in rates and other data. We cannot win this battle against competition and all of its mobilized forces unless the man who takes the order has every possible weapon that we can give him.

Remember also that we are spending very large sums of money and that if the expenditure of this money is to be effective, the cooperation of everyone in the industry is necessary. That is, each company must use the tools which we develop to the utmost of its ability. I am reminded of the symbol of authority used in the days of ancient Rome. It was a bundle of rods bound together signifying that singly the rods may be broken, but when bound together they are very strong. The Promotional Bureau binds together all of our companies in a strong bundle of action.

Please keep in mind that the Promotional Committee is your committee and the Promotional Bureau is your bureau. Neither seeks glory for itself and each strives only to serve you individually and the industry as a whole. We want your suggestions for promotion—we want to know what you want—we want the benefit of your counsel, your experience, yes, and we want your criticism.

The promotional work, whether it is done by a section, a committee or the Promotional Bureau or through the cooperative efforts of the various groups, will be done on the national level.

It will be designed to produce maximum results by coordinating the genius, the energy and the resources of the utilities, the manufacturers and the dealers. It will present a united front against our competitors and will become the spearhead for enlarging present markets and creating new outlets.

While the Promotional Committee and the other groups in the Association can carry on effective work at the top on a nation-wide and industry-wide basis, the real test of success, however, lies with you and the work you do in your own territories. This means that each utility and each manufacturer must undertake a comprehensive, aggressive and well-planned promotional program designed to retain and enlarge present loads and build new ones.

We will light the Blue Flame across the nation—it is your job to keep it bright in your community.

LIFE BEGINS—IN '46

(Continued from page 144)

great organizations and the various other regional and state associations coast-to-coast are invaluable in co-ordinating our local and national activities. Continually arising problems peculiar to a region and area can better be handled by these regional groups. Problems of a broader nature demand help on a wider scale which can best flow from a national organization. We need your help to make our national service more effective and we believe that you need us to get maximum results for your region and your localities. Working closely together, we can and shall accomplish much.

May I reiterate that the gas industry with its great heritage and its accelerated activity of the past decade has tremendous responsibilities and limitless opportunities. That it will rise to greater heights in discharging both seems assured when one recalls that we have the knowledge, the resources and the program. More than this we have a unity of purpose and a determination. Together these spell progress toward better living. In years to come when we look back for another bench-mark, I think we may well be able to say "Life did begin—in '46."

Residential Gas Section

J. J. QUINN, Chairman | WALLACE M. CHAMBERLAIN, Vice-Chairman | F. W. WILLIAMS, Secretary

New York-New Jersey Sales Conference To Feature Strong Program

J. J. Wholey

RENEWING full-fledged regional meetings which supplied so much gas sales ammunition in the prewar days, the annual New York-New Jersey Regional Gas Sales Conference sponsored by the Residential Gas Section of the American Gas Association will be held April 11-12 at the Westchester Country Club, Rye, N. Y. The conference will feature new angles in sales promotion, presented by outstanding gas company and manufacturer representatives.

J. J. Wholey, Rockland Gas Co., Spring Valley, N. Y., chairman of the conference, has announced a strong tentative program as prepared by his committee, comprised of W. D. Williams, Public Service Electric and Gas Co.; W. B. Hewson, The Brooklyn Union Gas Co.; C. A. Kennedy, New York & Richmond Gas Co.; and F. W. Williams, American Gas Association.

The tentative program calls for the lead-off speaker, a prominent gas company executive, to present overall sales objectives and methods of attaining them. Getting down to specific cases, following speakers at the Thursday session will cover the water heating and cooking fields. A leading water heater manufacturer will talk on "The Big Share of the Business Belongs to Gas," and the range presentation, analyzing consumer survey results and the future of gas cooking, will be titled "Who's Going To Do What to Who?" An analysis of the appliance outlook, with emphasis on volume and new features, will be presented by a representative of the Gas Appliance and Equipment Manufacturers.

A dinner meeting at 7:30 Thursday evening will feature an address on "Coordinating Management and Sales."

The Friday program will open with an authoritative analysis of financing plans by the chairman of the A. G. A. Appliance Financing Committee, H. W. Nichols, Rochester Gas and Electric Corp. His topic is "We Must Make It Easy To Buy." Of special timeliness will be an address on "What Price Dealer Participation" by H. S. Christman, chairman of the A. G. A. Committee on Dealer Relations and sales manager of The Philadelphia Gas Works Company. He will be followed on the program by a representative of the Surface Combustion Corp., originators of the "Quick Getaway Plan," who will describe latest developments in this all-gas merchandising program under the title "Capitalizing on the New Home Market."

Tying the whole program together on a national scale will be H. Carl Wolf, managing director, American Gas Association, who will conclude the conference with an up-to-the-minute account of the national research and promotional program.

Factors Governing Supply of Gas Ranges*

BY A. B. RITZENTHALER

Vice-President, Tappan Stove Co., Mansfield, Ohio

YOU are interested primarily in how many gas ranges will be produced in the first half of this year.

Unfortunately, no one can give an accurate figure at this time.

Factors limiting the supply are:

1. Labor shortages and time lost through labor troubles.
2. Material shortages—steel—particularly enamel stock—due to price control and increased mill costs. Actually, several mills discontinued rolling enamel stock sheet steel. We know of no plans for increased mill capacity for the first few months of this year. However, the last half year shows some promise.
3. A critical shortage exists in lumber for crating.
4. Thermostats—valves—electrical supplies, etc.

Factors which may relieve situation are:

1. Release of manpower from armed services. Many men released to date have not returned to work.
2. Release of surplus materials from army, navy on such items as crating lumber.
3. Increased production capacity of prewar gas range manufacturers plus new entrants in the field.
4. Settling of labor disputes.

In 1941 the gas range industry produced in round numbers 2,200,000 gas ranges. An average year was considered 1,700,000 gas ranges, or less than 150,000 per month. A few gas ranges were produced by the other than so-called Class A manufacturers, in the years 1942-43-44 and 45 up to VJ-Day.

The industry, according to best available estimates, produced at the rate of 110,000 units per month for the last quarter of 1945 or 60% of prewar capacity.

January should start off at the rate of 125,000 to 135,000 units per month.

W.P.B. conducted an industry-wide survey which indicated the industry planned expanded production facilities to produce at the rate of 256,000 units per month or 3,072,000 per year. A 40% increase in industry capacity—approximately $310,000,000.00 worth of gas ranges per year at retail.

However, it is not expected this rate will be reached before the second half of this year.

(a) The four-year war period backlog of consumer requirements is over 4,100,000 units. Divide this by three and we find 1,400,000 gas ranges needed—each year—for the next three years—to supply this backlog demand.

(b) Add the normal, pre-war annual consumer requirements of 1,700,000 per year. Therefore a minimum of 3,100,000 units or $310,000,000.00 worth of gas ranges are needed each year for the next three years to supply consumer requirements.

(c) Marriages increased over the past several years and are likely to continue at a high level for a few more years. Each one will require a cooking appliance.

(d) Unprecedented expansion of home building—a tremendous market for new gas ranges.

(e) The "LP" (Liquefied Petroleum) or bottled gas business predicted by outstanding authorities to grow at the rate of 500,000 new customers per year for the next ten years—each one will need a new gas range.

An avalanche of national advertising by the American Gas Association will presell your customer on gas ranges and particularly "CP" gas ranges.

The Gas Appliance Manufacturers Association is formulating very comprehensive plans for gas company dealer cooperation.

* Reprinted from "House Furnishing Review," February 1946.

To get your share of this $310,000,000 annual business—and do it profitably, select a well-known nationally advertised brand of gas range; look for unusual sales features, because the business will naturally be competitive; seek a manufacturer who will effectively train both your sales and service personnel; and develop incentive compensation plans to sell the higher-priced more profitable models.

Bryant Distributors Meet in Cleveland

VOLUME of business of the Bryant Heater Company is due for a sharp increase over the continuous upward sales trend which goes back to 1933, Lyle C. Harvey, president, told company distributors at the conclusion of a three-day meeting attended by Bryant wholesalers from 28 states. Harvey pointed to expanded plant—including an additional factory acquired in Cleveland, another being completed in Tyler, Texas, expanded engineering facilities at the main plant, and a new laboratory in Mentor, Ohio—greater number of employees, and intensive concentration on research and development of new and improved products, as Bryant preparations for the building and renovizing boom ahead.

"Prewar," Mr. Harvey said, "our markets were limited because our products were limited in range, using a deluxe fuel. Today our markets are virtually unlimited. We have a complete line of gas-fired heating equipment, and we're after volume. Gas has come into its own. To its advantages in service and convenience, its benefits in cleanliness and space-saving, has been added a relative decrease in cost by the almost universal use of natural gas, either straight or mixed. This has brought about a more general acceptance of gas for small, as well as large homes and commercial establishments.

"The superior service of gas as a fuel was demonstrated during the war. People will pay some extra cost for the advantages that gas unquestionably has. And, finally, we have the extension of the use of gas through the activities of those who are marketing bottled gas, whose business was not only expanding fast before the war, but will surely expand even faster in the next few years. One indication of this is in the fact that Montgomery Ward is setting up to sell bottled gas in rural and summer resort districts through its own stores, and will service its own customers out of these stores."

The three-day convention was devoted to the company's merchandising and promotional programs, with a review of the wide range of new Bryant products—for both domestic and industrial application.

Expanded operations of Bryant Heater Company are being discussed by Lyle Harvey (left), president of the company, a member of Dresser Industries, Inc., of which R. E. Reimer (right) is secretary-treasurer, and Elroy Payne (center), president of Payne Furnace Company, Beverly Hills, California, another Dresser member company

Kitchen Planning To Be Theme of McCall Awards

KITCHEN planning will be the theme of the sixth annual award offered by *McCall's Magazine,* through the American Gas Association, to public utility operating companies, home service directors, or representatives, or directors and members of the staff of companies engaged in kitchen planning operations, in the period from November 1, 1945 through June 30, 1946. The awards will be presented to the department or individual deemed to have made the most outstanding contributions to the advancement of living by means of educating the American housewife toward better-planned, gas-equipped kitchens.

While entries for the awards are no way restricted, any company or its employees may include an account of participation in the New Freedom Gas Kitchen program. Similar programs initiated under different titles or without specific names will be given equal consideration.

Five prizes will be offered in this year's award. The first prize will be an engraved plaque, bearing the name of the winner and to be retained one year, presented to a Home Service or Kitchen Planning Department. A duplicate plaque will be presented to the winning department for permanent possession. An individual prize of $150 in Victory Bonds and Stamps or cash will be awarded to the home service director, or directing head or to a member of the Kitchen Planning Department awarded first prize.

Winners of the second, third, fourth and fifth prizes will receive illuminated parchment certificates for the department, with individual prizes of $100, $75, $50, and $25 respectively, in Victory Bonds and Stamps or cash.

Entrants are asked to submit 4 copies of a report of 2,000 words or less, with one copy of any appropriate photographs, leaflets or other material showing the scope of the work, covering the following points: (a) The plan developed as a means of helping housewives to better kitchens; (b) The means used to achieve this result; (c) Progress made during the period to achieve this result; and (d) A summary of the accomplishments.

In order to guide the judges, each report should have a foreword giving the total number of residential customers served as a whole and by the particular division competing for the award; brief description of the territory served, as to whether it is a concentrated area or scattered with preponderance of small communities; and the number of company offices from which the activities were carried on. Simple straight-forward facts are preferable to elaborate reports, though samples of customer literature prepared and used in the company should be included.

The Jury of Awards will consist of five members of the gas industry, none of whom shall be officers or employees of the American Gas Association or associated with *McCall's Magazine.* In judging entries, accomplishments will be considered with relation to size of the entrant and the territory served, in order that small departments may compete on an equal basis with large departments.

The contest period will cover the period November 1, 1945 to June 30, 1946. Entries should be addressed to *McCall's Magazine* Awards, c/o American Gas Association, 420 Lexington Avenue, New York 17, N. Y., not later than midnight of July 15, 1946. The presentation of the awards will be made in October, 1946. Since the entries will have to be mailed or expressed to different parts of the country for judging, contestants are asked to limit entries to the article and a limited supply of customer and illustrative material.

"History of Cooking" Boosts Gas

AN attractive two-color 16-page, 8½ by 11-inch booklet entitled "The History of Cooking" has just been published by the American Stove Company to help perpetuate the use of gas as the most popular cooking fuel. It is divided into three parts: "Evolution of the Kitchen"—a photographic presentation of miniature kitchens displayed at the Chicago World's Fair; "Saga of the Gas Range"—an illustrated historical article on the development of the gas cooking stove over the years from 1882 until the present; and "The Magic Flame"—another pictorial display of the history of gas as a cooking fuel by the American Stove Company.

The booklet will be offered free to home economics teachers through advertising in "What's New in Home Economics." It will also be used by "Magic Chef" salesmen in training gas company and dealer personnel. For local distribution, it is available to the company's customers in quantities at $6.00 per hundred.

Heating by Immersion and Submerged Combustion

BY CHARLES C. EELES

Chairman, A. G. A. Committee on Heat Treating and Finishing with Gas, Industrial Engineer, The Ohio Fuel Gas Company, Toledo, Ohio

C. C. Eeles

TO tell you all I know about Heating by Immersion and Submerged Combustion in the time allotted will be relatively simple but to give this important subject the comprehensive treatment it deserves would require hours.

Optimum thermal efficiency results when combustion takes place within or below the surface of the solution or liquid to be heated.

Three phases of the problem are of importance to the industrial gas engineer—What are its uses? What equipment is suitable and available? How should such equipment be applied?

Immersion heating and submerged combustion find their principal low temperature applications in the heating of water-base solutions for cleaning, pickling and washing of metals. Fire tube boilers and water heaters—especially those with horizontal tubes—might likewise be included in this category. As we go up the temperature scale we find immersion heating used with success and high efficiency for black finishes on steel, deep fat frying, soft metal melting, interrupted quenching, galvanizing, salt bath heating and many other processes. The entire field of radiant tube heating might be included within the bounds of this subject.

Convenience a Factor

Convenience may frequently dictate the use of immersion heating equipment. When an interrupted quenching unit is in full operation the bath generally requires cooling rather than heating. Forcing cold air through the immersion tubes with the gas shut off provides a simple means of supplying the required cooling.

Smoke houses have always been difficult to equip with suitable automatic temperature control and ignition safeguards because of the gumming and corrosive effects of the smoke vapors and meat greases. We recently overcame these difficulties by mounting atmospheric immersion burners outside the houses and firing in through tubes suitable for proper heat distribution.

There are many other ways in which burners designed for immersion heating may be applied outside of their regular field to solve perplexing heating problems.

Certain immersion heating equipment should properly be designed, sized and installed by its manufacturer. Some, however, can be designed by the industrial gas engineer and installed under his supervision. In the first category are the Kemp, Dewey, submerged combustion and similar systems. Each has its own field which may or may not overlap that of others. It is important for the industrial gas engineer to know the applications to which each is best adapted. He must also have a general knowledge of the equipment and its principal characteristics.

Inside Track for Pickling

Submerged combustion gives gas the inside track in the pickling field. The flow of hot combustion products passing up through the solution provides the necessary heat, produces highly desirable violent agitation and replaces much of the water lost from the surface by evaporation. Accurate temperature control is possible and the setting can change quickly to accommodate variances in surface condition and type of work. Combustion air continues to flow through the solution even when the controls have the gas shut off. This continuous violent agitation allows the use of somewhat lower temperatures and reduces pickling time as much as 65 to 75 percent.

One company using submerged combustion for pickling has its tanks equipped with steam coils for standby. During gas shortage periods the combustion air flow is continued for its agitation effect. In sizing their burners, the submerged combustion people use a gas input of 8000 B.t.u.'s per square foot of liquid surface area per hour for any pickle tank regardless of depth. Under certain conditions this may be reduced to 7000 B.t.u.'s.

Immersion systems can and have been successfully employed for most solution heating and melting operations when materials with suitable heat and corrosion resistance can be economically utilized for the fabrication of the heat exchanging surfaces. Lead, tin and stereotype melting are important fields in which immersion heating with gas is already well established. It is now entering the field of salt baths and should prove one of our most potent weapons for combatting internally-heated electric pot furnaces. The suggestion has recently been made that galvanizing tanks be surrounded by a larger tank containing molten lead or salt heated by gas-fired immersion elements. More even heat distribution and greater pot life should be obtained by this method. The electric industry has made some successful galvanizing tank installations in this manner using lead as the secondary liquid. It should offer equal possibilities for gas.

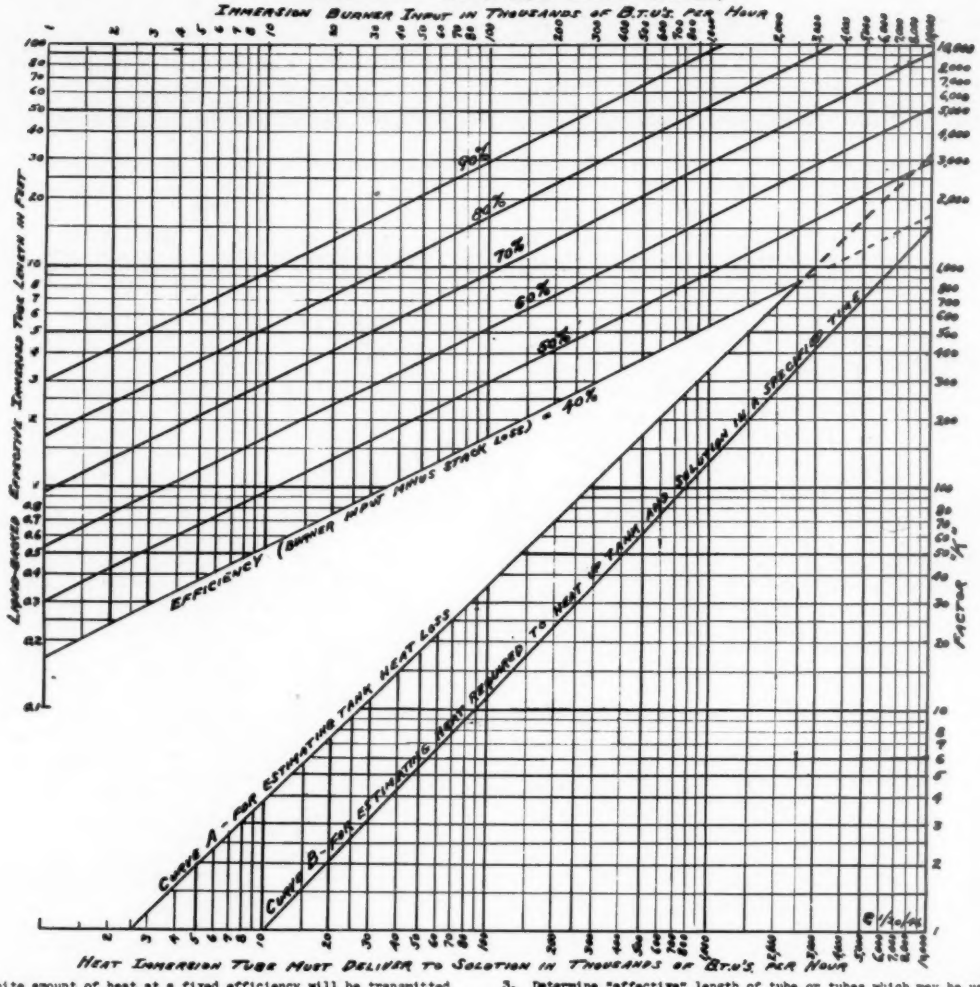
Immersion Heating Equipment

The simplest type of immersion heating system consists of a pipe coil into which a gas burner fires. Many firms make burners suitable for this purpose and their design is continually being improved. They can be of the atmospheric, blast or sealed in pressure type. Running the exhaust end of the tube vertically a few feet above the tank generally provides sufficient draft. Where small or exceptionally long coils are used the products of combustion are sucked through by means of eductors or exhaust fans. These burners become extremely useful when they are designed with built-in and accurately machined holders for a pilot burner, a safety pilot element and an ignition spark plug. One of the industrial gas engineer's greatest headaches has been his customer's desire for safe on and off automatic temperature control systems where the equipment and process could justify only moderately-priced burners and auxiliary equipment. As a result these fully-protected immersion burners have been adapted to a wide variety of applications some of which could hardly be called immersion heating.

The greatest use for the immersion burner is heating solution tanks of various sizes and shapes for cleaning, rinsing, fluxing and coating metals together with the countless

Presented at A. G. A. Industrial and Commercial Gas Conference, Toledo, Ohio, March 29-30, 1946.

SOLUTION HEATING DATA SHEET



1. A definite amount of heat at a fixed efficiency will be transmitted by a given length of gas-fired immersion tube regardless of diameter. This relationship is shown by the upper section of the above curve which is plotted in accordance with the formula:

$$\text{Efficiency} = 20 \log\left[\frac{L^2}{R}\right] + 71$$

Where: Efficiency = thermal efficiency (input minus flue gas loss) in percent
L = effective length of tube (total submerged length measured on center line from burner to foot of stack riser plus 1.1 feet for each elbow or return bend) in feet
R = burner input rate in thousands of Btus. per hour.

2. From tank dimensions, temperature and load determine heat tube must deliver to solution.
The lower section of the above curve may be used in the following manner to obtain a quick estimate of this figure for tanks containing water solutions.
   a. For hourly heat loss from bare steel tanks having average depth and no appreciable surface agitation

$$K = \text{Surface area in sq. ft.} \left[\frac{^\circ F \text{ above room temperature}}{100}\right]^2$$

   Using this K factor determine approximate hourly heat loss from Curve A.
   b. For heating up requirement under same conditions

$$K = \left[\frac{\text{Solution volume in cu. ft.} \times ^\circ F \text{ above room temperature}}{\text{Allowable heating time in hrs.} \times 100}\right]$$

   Using this K factor determine approximate hourly heat requirement from Curve B.
   c. Where sprays or excessive surface agitation create abnormal evaporation losses a suitable allowance must be added to the heat losses as determined under "a" and "b".

3. Determine "effective" length of tube or tubes which may be used. On upper curve section follow horizontal line for determined "effective" length (L) of tube to point where input (R) x thermal efficiency (E) = heat delivery requirement as determined in step 2.
4. Mechanical suction or high stacks may be used to increase allowable tube length. However, their use to increase input without increase in tube length results in decreased efficiency.
5. Friction increase caused by return bends and els is greater than the additional heat delivery due to the 1.1 foot increase in "effective" length due to these same fittings. Therefore, they should not be used to provide additional heat delivery except with mechanical draft or sealed in premix burners.
6. Short baffled tubes have greater frictional resistance than longer unbaffled tubes having same input and efficiency.
7. Noise: Tube diameter and length have no effect. Input has an effect only when burner is running very low. Restriction of outlet decreases noise and increases efficiency and heat delivery. Sealed in burner has highest noise level. A commercial silencer is helpful on the tube outlet. To reduce resonance equip tube with a tee and dead end tube approximately $\frac{1}{2}$ the length of the main tube.
8. Ratings of Surface Combustion immersion burner inputs with manufactured gas at 3" and natural gas at 6" water column:

Coil Inlet Diameter	Atmospheric Burners (with 5 ft. stack)		Suction Burners (using eductor)		
		Effective		Effective	Eductor
(inches)	M Btu/hr.	Tube Length	M Btu/hr.	Tube Length	size
2	30	10 ft.	80	19 ft.	2"
3	65	14 ft.	160	26 ft.	2"
4	110	16 ft.	300	34 ft.	3"
6	230	21 ft.	650	49 ft.	4"

9. For pickle tanks heated by Submerged Combustion units provide maximum burner capacity equal to 8000 Btu's. per hr. per sq. ft. of liquid surface.

Data sheet by = C.C.K., R.L.L., and M.E.S.
1/28/46.

other processes employing hot liquids which are common to modern industrial plants.

Early in 1944 the A. G. A. Laboratory released the results of its comprehensive investigation of immersion heating by means of round tubes. Some interesting important conclusions were reached. It was shown that for a given burner input the thermal efficiency is governed only by the effective liquid-backed length of the immersion tube. A formula relating these factors was developed.

$$E = 20 \text{ Log} \left[\frac{L^2}{R} + 71 \right]$$

Where: E = efficiency in percent.
L = "effective" length of liquid-backed immersion tube in feet. It is equal to the actual length in feet measured along the center line of the liquid-backed portion of the tube from the burner to the foot of the stack riser plus an allowance of 1.1 feet for each 90° elbow or return bend.
R = burner input in thousands of B.t.u.'s per hour.

The upper section of the curve sheet presented with this report is plotted from this formula.

The same investigation produced figures for the gas-burning capacity of various diameters of standard pipe. In practice, however, they may be greatly exceeded. For that reason it is better to use the capacities given by the burner manufacturers. It is likewise well to stick pretty close to the manufacturers figures for "effective" tube length. Where tubes have high values of "effective" length eductors should be used. If the calculated pressure loss through the tube is over 1.5 inches water column an exhaust fan should be substituted for the eductor.

Calls for the burner equipment necessary to heat water-base solution tanks of all types have become so frequent that we made up a "Quicksie" for solving such problems. Two basic figures are required on every solution heating job—first, the heat loss at operating temperature—second, the heat delivery to the solution required to bring it to operating temperature in a specified time.

We found the approximate overall heat loss could be related by means of Curve A to a constant obtained from multiplying the solution surface area in square feet by the square of the temperature rise divided by 100, thus:

$$K = \left[\begin{matrix} \text{Solution surface} \\ \text{area in sq.ft.} \end{matrix} \right] \times \left[\frac{\text{°F above room temperature}}{100} \right]^2$$

Similarly the rate at which heat must be delivered to a water-base solution in order to bring it to operating temperature in a specified time may be related by means of curve B to a second K factor obtained from multiplying the solution volume in cubic feet divided by the heating time in hours by the temperature rise divided by 100, thus:

$$K = \left[\frac{\text{Solution volume in cu.ft.}}{\text{Heating time in hours}} \right] \times \left[\frac{\text{°F above room temperature}}{100} \right]$$

Remember that the figures obtained from the use of the above K factors and shown across the bottom of the chart represent amounts of heat which the immersion tube must actually deliver to the solution. On the other hand those shown across the top are burner inputs.

If we need an immersion tube to heat a tank 3 feet by 5 feet having a water-base solution 2.5 feet deep, operating at 170° F. and having an allowable heating up time of 4 hours, the calculations would be made as follows:

$$\text{Heating up K factor} = \left[\frac{3 \times 5 \times 2.5}{4} \right] \times \left[\frac{(170 - 70)}{100} \right] = 9.4$$

From curve B we find the required heat delivery is 82,000 B.t.u.'s per hour. If we want to handle the job with an atmospheric immersion burner we would probably choose the 4-inch size having an input rating of 110,000 B.t.u.'s per hour and a normal "effective" coil length of 16 feet. Using three passes in the 5-foot direction the center line distance from burner to the base of the stack will be approximately 3 x 4 plus 2 x 1 for the crossways between legs or a total of 14 feet. To this we add 5 x 1.1 for the 90° elbows. The result is an effective length of 19.5 feet. On the upper chart a burner input of 110,000 B.t.u.'s per hour and an effective coil length of 19.5 feet shows an efficiency of 81 percent. The coil will, therefore, deliver 110,000 B.t.u.'s x 0.81 = 89,100 B.t.u.'s per hour and the solution can be heated in just under the required four hours. In this particular instance the use of the three-pass coil will require a stack height of eight to nine feet in order to provide adequate suction. To obtain highest efficiencies the tube diameter is reduced by one pipe size just after coming around the elbow into the last pass. The tank discussed above, therefore, would have a 3-inch pipe for its last pass and the stack would be 3-inch.

Heating by immersion and submerged combustion allows gas the optimum use of its form value and results in highest utilization efficiencies. The temperature of the heating elements never greatly exceeds that of the solution and their mass is relatively small thus minimizing heat storage in them and any consequent adverse effect on temperature control. Proper location of the elements eliminates the necessity of driving heat through heavy pot walls or through dross and scale formations. Less expensive pot materials may be used and longer life obtained. Insulation may be applied directly to the outside of the pot increasing efficiency and minimizing the shell temperatures to which the workmen are subjected. Heat exchangers require changing only infrequently and this operation may be performed quickly and inexpensively without loss of solution or rebuilding the pot setting. Where desirable, exhaust gases from the heating elements may be used to protect the solution or liquid surface.

Applications for this type of equipment are rapidly increasing. It is one of the most important tools now at the command of the industrial gas engineer. He must study it carefully and learn to use it effectively.

Food Service Equipment Committee Meets

Furthering its four-point program of sales promotion, sales training, appliance upgrading, and manufacturers' cooperation, the A. G. A. Food Service Equipment Committee recently completed its organization and preliminary work at a meeting in New York. Attending the all-day session were, left to right: Leon Ourusoff, chairman, Food Service Equipment Committee, Washington Gas Light Co.; Walter S. Anderson, chairman, Subcommittee on Sales Training, Boston Consolidated Gas Co.; C. C. Hanthorn, chairman, Subcommittee on Cooperation with Manufacturers, The Philadelphia Gas Works Co.; Roy E. Wright, representing Industrial and Commercial Gas Section Managing Committee, N E G E A Service Corp.; J. A. Rockefeller, chairman, Subcommittee on Sales Promotion, Public Service Electric & Gas Co.; and Harry B. Wilson, chairman, Subcommittee on Appliance Upgrading, The Brooklyn Union Gas Company

Toledo Conference

THE 1946 A. G. A. Sales Conference on Industrial and Commercial Gas was held Friday, March 29 and Saturday, March 30 at the Commodore Perry Hotel in Toledo, too late for reporting in this issue of the MONTHLY. However, two important papers are included in full: "Applying High Speed Direct Gas Heating" by Frederic O. Hess, Selas Corp. of America; and "Heating by Immersion and Submerged Combustion" by C. C. Eeles, The Ohio Fuel Gas Co. A complete factual and pictorial account of the Conference will appear in the May issue.

gas grapevine

875,000 m.c.f. of natural gas were burned in a new castle, pa., muffle-type kiln in the firing of vitreous china sanitary ware. This was over a period of *17 years of continuous operation* until the kiln was shut down for muffle and arch repairs.

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gas finds many novel uses. now it is being used in the manufacture of synthetic flints for cigarette lighters by a bronx, n. y., manufacturer. the weber metals company has seven gas-fired furnaces and a gas-fired boiler which will use an estimated three million c. f. of gas per year.

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public service electric and gas co. (new jersey) reports that 51 new industries located in their territory during 1945. gas service to each one?

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high hat candy made in new york by la comtesse de segur uses low brow gas in a 10 h.p. boiler, three bake ovens, fifteen confectionery stoves, two ranges and ten chocolate cookers to make a superior product.

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leon ourusoff and his food service equipment committee are off to a flying start to reach the goals of their objectives. walter anderson, harry wilson, j. a. rockefeller and c. c. hanthorn are the guiding lights on this job. other committees watch out 'cause this bunch are going to raise a big cloud of dust—they're goin' places.

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brooklyn union boys on the job again. another conversion to gas, this time it's bowey's inc., who make supplies for the confectionery trade who have just installed four jabez burns cocoa roasters.

a. q. s.

Industrial and Commercial Hall of Flame Instituted by American Gas Association

KNOW ye all men by these presents, greetings: Acknowledging with grateful appreciation the many contributions to the welfare and progress of the gas industry through services performed in the Industrial and Commercial Gas Section of the American Gas Association, this certificate is awarded to:"

So reads the legend on the certificate that has been awarded at the A. G. A. Sales Conference on Industrial and Commercial Gas at the Commodore Perry Hotel, Toledo, Ohio, March 30, 1946, to those men whose services have made outstanding contributions to the Industrial and Commercial Gas Section.

Harry A. Sutton, chairman of the Section, suggested that something should be done to recognize the efforts of the many gas men in the Section activities, so on action by the Managing Committee, the Industrial and Commercial Hall of Flame was created. It was decided that to be eligible for life membership in this exclusive and honorary organization, certain qualifications should be met, as follows:

First, having been a chairman of the Section constitutes sufficient service in itself to qualify. Second, accumulation of 25 points through services in the Industrial and Commercial Gas Section are necessary as follows:

Chairman of a Section Committee . . . 5 points
Member of a Section Committee . . . . 2 points
Presentation of a paper at A. G. A. Annual Meeting or Section Conference . . . . . 5 points
Article in a trade magazine or paper prepared for presentation before an outside organization . . . . . 5 points

In going over the Association and Section records for the past ten years and evaluating services on the above basis, the following men were found to be eligible for life membership in the "Industrial and Commercial Hall of Flame:"

Past Chairmen:

*R. M. Searle, Rochester Gas & Electric Corp., Rochester, N. Y.
Horace C. Clark, The Peoples Gas Light & Coke Co., Chicago, Ill.
*Henry O. Loebell, Combustion Utilities Co., New York, N. Y.
F. F. Cauley, The Peoples Gas Light & Coke Co., Chicago, Ill.
F. C. Mackay, Public Service Co. of Northern Illinois, Chicago
J. P. Leinroth, Public Service Electric & Gas Co., Newark, N. J.
Chas. C. Krausse, Consolidated Gas Electric Light & Power Co. of Baltimore, Md.
D. W. Chapman, The Peoples Gas Light & Coke Co., Chicago, Ill.
Wm. F. Miller, Public Service Co. of Northern Illinois, Chicago
Edward L. Wilder, Rochester Gas & Electric Corp., Rochester, N. Y.
F. B. Jones, Equitable Gas Co., Pittsburgh, Pa.
J. F. Quinn, The Brooklyn Union Gas Co., Brooklyn, N. Y.
Chas. W. Gale, Knoxville Gas Co., Knoxville, Tenn. (now Surface Combustion Corp.)
Ralph L. Manier, Central New York Power Corp., Syracuse, N. Y.
Hale A. Clark, Michigan Consolidated Gas Co., Detroit, Mich.
Frank H. Trembly, Jr., The Philadelphia Gas Works Co., Philadelphia, Pa.
Franklin T. Rainey, The Ohio Fuel Gas Co., Columbus, Ohio
H. Carl Wolf, Atlanta Gas Light Co., Atlanta, Ga.
Geo. F. B. Owens, The Brooklyn Union Gas Co., Brooklyn, N. Y.
Ben H. Gardner, Columbia Engineering Co., Columbus, Ohio
Chas. G. Young, Springfield Gas Light Co., Springfield, Mass.
Harry K. Wrench, Minneapolis Gas Light Co., Minneapolis, Minn.

Those having 25 points or more, in order of their standing:

Lawrence E. Biemiller, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
Harry A. Sutton, Public Service Electric & Gas Co., Newark, N. J.
Lawrence R. Foote, Central Illinois Electric & Gas Co.—now The Bryant Heater Co., New York, N. Y.
Karl Emmerling, The East Ohio Gas Co., Cleveland, Ohio
Roy E. Wright, Negea Service Corp., Cambridge, Mass.
L. S. Reagan, Webster Engineering Co., Tulsa, Okla.
Thos. J. Gallagher, The Peoples Gas Light & Coke Co., Chicago
Carl H. Lekberg, Northern Indiana Public Serv. Co., Hammond, Ind.
Albert A. Schuetz, Milwaukee Gas Light Co., Milwaukee, Wisc.
F. T. Brooks, Philadelphia Elec. Co., Philadelphia, Pa.
Wm. D. Thompson, The Laclede Gas Light Co., St. Louis, Mo.
Carroll B. Mershon, Pennsylvania Industrial Engrs., Pittsburgh, Pa.
Harold O. Andrew, Robbins Publishing Co., New York, N. Y.
Leon Ourusoff, Washington Gas Light Co., Washington, D. C.
Frederic O. Hess, Selas Corp. of America, Philadelphia, Pa.
Henry Obermeyer, Consol. Edison Co. of N. Y., Inc., N. Y.
Walter F. Friend, Ebasco Services Inc., N. Y.
Chas. R. Bellamy, E. Holley Poe & Associates, New York, N. Y.
Clayton S. Cronkright, Public Service Electric & Gas Co., Newark, N. J.
H. C. Haroldson, The Commonwealth & Southern Corp., Jackson, Mich.
Frank S. Kelly, Jr., Arkansas-Louisiana Gas Co., Shreveport, La.

The
Industrial and Commercial
Hall of Flame

Know ye all men by these presents, greetings: ACKNOWLEDGING WITH GRATEFUL APPRECIATION THE MANY CONTRIBUTIONS TO THE WELFARE AND PROGRESS OF THE GAS INDUSTRY THROUGH SERVICES PERFORMED IN THE INDUSTRIAL AND COMMERCIAL GAS SECTION OF THE AMERICAN GAS ASSOCIATION, THIS CERTIFICATE IS AWARDED TO:

Lawrence E. Biemiller

AND SYMBOLIZES HIS MEMBERSHIP FOR LIFE IN THE INDUSTRIAL AND COMMERCIAL HALL OF FLAME

Presented this 30th day of March nineteen hundred and forty-six

CHAIRMAN, INDUSTRIAL AND COMMERCIAL GAS SECTION

MANAGING DIRECTOR, AMERICAN GAS ASSOCIATION

SECRETARY, INDUSTRIAL AND COMMERCIAL GAS SECTION

Daniel J. Brogan, The G. S. Blodgett Co., Inc. N. Y. C.
Edward P. Kramer, Ebasco Services Inc., New York, N. Y.
Chas. F. Henness, Public Service Co. of Northern Illinois, Chicago
A. O. Leech, Portland Gas & Coke Co., Portland, Ore.
Chas. E. Lucke, Consolidated Edison Co. of N. Y., Inc. N. Y. C.
John P. Brosius, Equitable Gas Company, Pittsburgh, Pa.
Robert H. Staniford, formerly: The Brooklyn Union Gas Co., Brooklyn, N. Y. now: Perfection Oven Co., N. Y.
Ray Trowbridge, Seattle Gas Co., Seattle, Wash.
Walter S. Anderson, Boston Consolidated Gas Co., Boston, Mass.
Henry M. Heyn, Surface Combustion Corp., Toledo, Ohio
Albert M. Thurston, The East Ohio Gas Company, Cleveland, Ohio
Edward J. Hatzenbuehler, Lone Star Gas Company, Dallas, Tex.
George M. Parker, Mississippi Valley Fuel Co., St. Louis, Mo.
W. W. German, Montana Power Co., Butte, Mont.
*L. B. Crossman, Boston Consolidated Gas Co., Boston, Mass.
Joseph H. Gumz, Pacific Gas & Electric Co., San Francisco, Calif.
Terry Hart, Nashville Gas & Heating Co., Nashville, Tenn.
Don H. Thorburn, United Gas & Fuel Co. of Hamilton, Ltd. Hamilton, Ont., Can.
Henry M. Wollman, Jr. Jersey Central Power & Light Co., Asbury Park, N. J.

(*) Deceased.

Lawrence E. Biemiller, Consolidated Gas, Electric Light & Power Company of Baltimore, has accumulated the greatest number of points during the past ten years.

Each year as other men accumulate 25 points, they will be given their life membership in this new and unique group of gas men who have had such a large part in making the Industrial and Commercial Gas Section what it is today.

Astor Kitchen Adopts Nickel Range Tops

COOKING equipment in metropolitan hotel kitchens really takes a beating, in view of the 18-hour-a-day operation that must be maintained, thus subjecting the stove parts to the ravages of high temperatures almost continuously.

The Hotel Astor is not only noted for good food, but is also a natural meeting place at luncheon and dinner hours for many of the throngs of people who frequent the populous Times Square area in New York. In the Astor's main kitchen, more than 2,500 meals are prepared daily on 38 gas-fired ranges.

Maintenance problems were for some time greatly complicated by the necessity of replacing range tops every few months. These tops, made of plain cast iron, would soon warp or sag, thus creating an uneven heating surface, or sometimes fail completely by cracking.

A solution for this annoying problem was found by the adoption of "Ni-Resist" tops furnished by Universal Grate Company of New York City. Now the frequent periodic replacement has become a thing of the past, as has also the temporary necessity of working with warped or otherwise defective tops. The nickel-copper-chromium iron stands up for many times the life of the old cast iron, since the alloy content provides improved resistance to scaling, distortion and "thermal shock" from intermittent heating and cooling. The surface of Ni-Resist tops stays smooth end level, providing maximum contact between stove tops and utensils, thereby increasing cooking efficiency and reducing food spoilage.

As a result of the Astor's experience with the cast-nickel alloy in the main kitchen, all range tops in the secondary kitchen on the 8th floor of the hotel were recently replaced with Ni-Resist, and shortly all stoves in the Astor will be complete Ni-Resist equipped.

Many other well-known New York hotels and restaurants are switching to Ni-Resist to simplify culinary maintenance problems. Among these are the Colony Restaurant, Jack Dempsey's Restaurant, Cafe Louis XIV, El Morocco, and the Pennsylvania, and New Yorker Hotels.

—*Nickel Cast Iron News*

Metal Industry Called Geared To Natural Gas

WILLIAM O. OWEN, Chicago district manager of Surface Combustion Co., told the Federal Power Commission during the Chicago natural gas hearing that the metal industry was "closely geared to natural gas."

Mr. Owen was presented by the State of Michigan, which for two days previously had called upon state political and industrial leaders to support its demand for importation of more natural gas.

Mr. Owen declared that radiant tube heating had "revolutionized" the annealing of steel and that natural gas was "preferable" by far as a fuel for that process.

"Natural gas is stable, easily controlled and lacks elements harmful to metal surfaces," he said. "It is the only medium that can supply both heat and proper atmosphere needed in certain heat-treating processes."

In answer to a query Mr. Owen said: "In most of the specialized heat-treating processes natural gas is preferable to electric radiation, even if the cost differential is not a factor."

"The preference rests upon the recognized mechanics in natural gas furnaces, which are universally used," he said.

A rut is akin to a grave—it's only a question of depth.—*Selected*

Technical Section

LESTER J. ECK, Chairman | C. S. GOLDSMITH, Vice-Chairman | A. GORDON KING, Secretary

A.G.A. Distribution and Motor Conferences

MONDAY, APRIL 15—10:00 A.M.
STEVENS HOTEL, CHICAGO
Joint Session

Opening Remarks
T. H. Kendall, Chairman, Distribution Committee, Pittsburgh, Pa.

Address of Welcome
Karl B. Nagler, The Peoples Gas Light & Coke Co., Chicago, Ill.

A Message from the Association
E. J. Boothby, President, American Gas Association

Distribution—A Vital Link
H. Carl Wolf, Managing Director, American Gas Association

Emergency FM Radio Communication
J. P. Woodward and W. R. McMillan, Union Electric Company of Missouri, St. Louis, Missouri

Mobile Radiotelephone Service—Present and Future Plans
S. S. Brodsky, Service Manager, Illinois Bell Telephone Co., Chicago, Illinois

Joint Discussion
Discussion Leader, W. T. Bulla, Natural Gas Pipeline Co. of America, Chicago, Illinois

12:30 P.M.
LUNCHEON CONFERENCE
ON MOTOR VEHICLE PROBLEMS
MONDAY, APRIL 15, 1946

L. Edsall, Chairman, Philadelphia Electric Co., Philadelphia 3, Pa.

Training of Maintenance Supervisors
Carl G. Seashore, Associate in Charge of Motor Fleet Safety Education, The Pennsylvania State College

Fluid Drive
W. L. Carnegie, Chief Engineer, Detroit Transmission Division, General Motors Corporation

Driver Testing
F. M. Rudman, Michigan Consolidated Gas Company

Discussion Subjects:
- Wide Base Rims
- Types of Paint Used on Trucks
- Wheel Balancing
- Fuel Pump Governors
- Experience with Magnetic Plugs
- Maintenance Practices
- Puncture Sealing Tubes
- Running-in of New or Rebuilt Motors
- Road Calls
- Handling of Gasoline

LUNCHEON CONFERENCE
ON CONSTRUCTION AND MAINTENANCE
MONDAY, APRIL 15, 1946

E. L. Henderson, Chairman, United Gas Corporation, Houston, Texas

Discussion Subjects:
- Equipment for Boring and Pushing Pipe
- Locating Water in Low Pressure Gas Mains
- Use of Aerators to Remove Gas from Saturated Ground
- Safety Practices
- Leakage Surveys
- Cast Iron Pipe Standards
- Electric Welding vs. Oxy-Acetylene Welding
- Pumping Gas During Emergencies with Portable Air Compressors
- What Maximum and Minimum Pressures Should Be Maintained at Consumers' Meters?
- Distribution Construction Work by Contractors
- New Construction Methods To Offset Higher Construction Costs
- Machine Equipment for Installing Service Lines
- The Use of Oil Seal Relief Valves
- Miscellaneous Wrinkles and Gadgets
- Venting Regulator and Large Gate Vaults
- Use of Copper Pipe for Service Lines

LUNCHEON CONFERENCE
ON METERS AND METERING
MONDAY, APRIL 15, 1946

A. V. Brashear, Chairman, Michigan Consolidated Gas Co., Detroit, Michigan

Discussion Subjects:
- Domestic Regulators and Their Maintenance
- The Solder Situation
- Silicones and Their Possible Application to Gas Meter Diaphragms
- Safety in the Meter Shop
- Some Thoughts on Uniform Sizing and Nomenclature
- Field Testing for Large Meters
- Carbon Valve Covers
- Synthetic Diaphragms
- The Supply Situation in the Meter Field

TUESDAY, APRIL 16—9:30 A.M.
Joint Session

Opening Remarks
S. G. Page, Chairman, Motor Vehicle Committee, Pittsburgh, Pa.

Air Compressor Tools—Their Maintenance and Repair
B. D. Connor, Vice-Chairman, Motor Vehicle Committee, Boston, Mass.

The selection, use, maintenance and testing of the tools operated from portable air compressors on gas distribution work; a report of the subcommittee on compressor tools based on a survey of the practices and opinions of 20 gas companies and 7 tool manufacturers and rebuilders.

Standardization of Motor Truck Bodies
Sidney F. Gale, Chairman, New Orleans, La.

Accident Prevention, Not A One Man Job
E. C. Woodward, Illinois Institute of Technology, Chicago, Ill.

Motion Picture—"Gas"
A technicolor sound film, showing construction over difficult terrain of the longest large diameter gas pipe line in the world. The 24" line shown was constructed as a vital war project from Corpus Christi, Texas, to Cornwell, West Virginia —1,265 miles in the record time of 292 days.

12:30 P.M.
LUNCHEON CONFERENCE
ON MOTOR VEHICLE PROBLEMS
TUESDAY, APRIL 16, 1946

E. W. Jahn, Chairman, Cons. Gas Electric Light & Power Co. of Baltimore, Baltimore, Maryland

Discussion Subjects:
- Use of lifts versus creepers in repair shops.
- Valuation of vehicles with regard to insurance against loss.
- Practice with regard to pooling general body type truck equipment, such as stake and dump bodies.
- Policies regarding assignment of passenger cars for the exclusive use of key personnel.
- Practice in selecting type of equipment in borderline cases where passenger cars or light trucks might be used.
- Changes in garage organization or additions to personnel necessary to service radio equipped vehicles.
- Policy with respect to use of personally owned passenger cars on company business and rate of reimbursement.
- Size of battery for radio communication cars and trucks, and methods of charging.
- Experience with gasoline burning type heaters versus hot water or hot air types.
- Age or mileage at which passenger cars and light trucks are replaced.

Experience with detergent oils.
Has the use of insulating material such as P.I.B. on top of batteries or ignition wires been of any value?
Experience with Thorton locking rear axles.
Experience with quick charging.
Use of self locking nuts.
Method of determining the need for additional transportation equipment.
Relationship of transportation to other operating expense.

LUNCHEON CONFERENCE
ON WORK ON CUSTOMERS' PREMISES
TUESDAY, APRIL 16, 1946

J. M. Pickford, Chairman, Northern Indiana Public Service Co., Hammond, Indiana

Discussion Subjects:
Appliance Problems
Installation and Servicing Manuals and Pamphlets
Servicemen Training Programs
Dealer Installations—Policies on Turn Ons
Safety as It Pertains to the Service Department
Experiences with Chimney Liners
Quality Control of Installations
Charge for Service Policies
Replacements for Obsolete Appliance
Use of Appliance Regulators
Servicemen Job Classifications and Descriptions

LUNCHEON CONFERENCE
ON PIPE COATINGS AND CORROSIONS
TUESDAY, APRIL 16, 1946

R. F. Hadley, Chairman, Susquehanna Pipe Line Co., Philadelphia, Pa.

Discussion Subjects:
Corrosion Problems
Sacrificial Anodes
Discussion of C. L. Morgan paper "Zinc Anodes for Preventing Corrosion of Distribution Mains"
Prepared Discussions by Members of Subcommittee on Pipe Coatings and Corrosion

WEDNESDAY, APRIL 17—10:00 A.M.
DISTRIBUTION CONFERENCE SESSION

T. H. Kendall, Chairman—Distribution Committee, Presiding

Sacrificial Anodes
Dr. Kent M. Wight, Research Associate, American Gas Association

Automatic Loading of District Governors
F. J. Woolfenden, Engineer of Distribution Design, Michigan Consolidated Gas Co., Detroit, Mich.

Supervisors' Part in Industrial Relations
E. O. Keller, Training Supervisor, Philadelphia Co., Pittsburgh, Pa.
Industrial Relations and Good Management—Causes of Labor Dissatisfaction—Policies and How They Affect Industrial Relations—the Necessity for Effective Administration of Policies—the Supervisor as the Most Instructive Influence in a Worker's Job Life—Proper Development of Supervisors—Leadership, the Key to the Situation.

Discussion

JOINT
PRODUCTION AND CHEMICAL COMMITTEE CONFERENCE
MONDAY, TUESDAY, WEDNESDAY
June 3, 4, 5
Hotel Pennsylvania
New York, N. Y.

2:00 P.M.
DISTRIBUTION CONFERENCE SESSION

J. H. Collins, Vice-Chairman—Distribution Committee, Presiding

REPORTS OF COMMITTEE DEVELOPMENTS AND LUNCHEON CONFERENCE SUMMARIES

Safety
L. K. Richey, Chairman, Michigan Consolidated Gas Co., Detroit, Mich.

Construction and Maintenance
E. L. Henderson, Chairman, United Gas Corp., Houston, Texas

Meters and Metering
A. V. Brashear, Chairman, Michigan Consolidated Gas Co., Detroit, Mich.

Pipe Coatings and Corrosion
R. F. Hadley, Chairman, Susquehanna Pipe Line Co., Philadelphia, Pa.

Work on Customers' Premises
J. M. Pickford, Chairman, Northern Indiana Public Service Co., Hammond, Ind.

Open Forum
New Devices and Equipment

An exhibit of the latest radio equipment of interest to Distribution Engineers will be on view during the meetings, and an interesting demonstration is scheduled for the conclusion of the Luncheon Conferences on April 15.

INSTITUTE OF GAS TECHNOLOGY INSPECTION

Conference delegates are cordially invited to inspect the Institute of Gas Technology, 3300 Federal Street, Chicago, Ill. Interesting demonstrations of *Fluidization* and *Gas Conditioning Procedures* are scheduled at the conclusion of the Conference program on Monday, Tuesday and Wednesday. The Institute of Gas Technology will also accommodate those conference delegates who plan to leave Chicago on Thursday, April 18. Small parties will be organized, and members are requested to indicate their intention to participate in this visit to the Institute at the time of registration.

Trends in Gas Turbine Development

In view of recurring interest in the subject, C. GEORGE SEGELER, utilization engineer of the American Gas Association, has summarized recent developments in the gas turbine field. His summary, which follows, and the accompanying bibliography, give the latest available information of interest to the gas industry.

THE present state of turbine development is predicated on using high nickel chrome alloy steels which will withstand operating temperatures of 1400°. (This contrasts with an operating temperature of a little over 1000° in the unit developed by the Brown Bovery Company around 1940 for installation in a Swiss railway locomotive.) At this temperature and with suitable cooling, reheating and heat salvage means, it is expected that efficiencies of 34% approaching those of the diesel engine will be developed. This represents the most advanced present use of the turbine as a prime mover and the Elliott Company is building several marine propulsion units along these lines.

In the small turbine field, the only commercial use at present is where high pressure waste gases can be applied. One such use is in the airplane turbo super charger where exhaust gases furnish the driving power. For an essential need that is compressed air. The second application is in connection with the air required for air removal in catalytic cracking chambers. Here waste heat and waste energy are also utilized so that thermal efficiency is not a factor.

In view of these limitations, it is my belief that at this time there is little opportunity to develop a gas turbine. There may be some use for such a unit as a natural gas pumping engine but immediate prospects even in this direction do not appear to be too bright.

The essence of the entire problem is in the development of high strength temperature and corrosion resistant blades and combustion chambers. These are essentially metallurgical problems unless by chance a ceramic unit could be developed along the lines of the new Gas Machinery Company's high temperature roller hearth.

From a theoretical aspect, there is nothing to prevent the immediate construction of natural gas turbines but practical and economic considerations have apparently not yet justified this equipment. I do believe that a Brown Bovery natural gas 2,000 h.p. turbo generator is being constructed for a Rumanian natural gas operation. There are, however, some unusual factors involved in this application which is for a standby plant; hence, even this construction does not, in my opinion, indicate an early development of the gas turbine.

BIBLIOGRAPHY

Mechanical Engineering, pp. 127-133, February 1946. Gas-Turbine Fundamentals by Dale D. Streid, Aircraft Gas Turbine Division of the G. E. Company. Basic thermody-

namic principals together with interesting unit figures used for calculating efficiencies and capacities of various elements of the gas turbine systems. Performance comparisons are furnished for various internal combustion figures and a short bibliography is appended.

Mechanical Engineering, pp. 229-233, April 1945. High Temperature Gas-Turbine Power Plants by J. S. Haverstick and A. M. G. Moody of the De Laval Steam Turbine Company. Article suggests the advantage of operating at 1500° F. without requiring the use of an inefficient initial stage. Propose use of air from compressor to cool parts of the turbine subject simultaneously to high stress and high temperature. This is an important improvement but so far is only in the development stage and may increase the complexity and reduce the performance of the turbine.

Mechanical Engineering, pp. 373-383, June 1945. The Basic Gas-Turbine Plant and Some of Its Variants by J. Kenneth Salisbury of G. E. Company. Historical article furnishing engineering data on the performance of turbines at various stages in their development. Good for a quick general comparison of the possibilities of gas turbines in contrast to steel and diesel plants with some idea on future progress. No information on natural gas operation.

Mechanical Engineering, pp. 363-368, June 1944. Gas Turbines—Present Status and Future Prospects by S. A. Tucker, Associate Editor of "Power."

Transactions of the ASME, pp. 61-73, January 1944. Superchargers for Aircraft Engines by R. G. Standerwick and W. J. King of G. E. Company. Technical exposition of the basic principal characteristics and functioning of superchargers used in airplanes. Since this was issued during war time the text is naturally limited by the need for military secrecy. It must be borne in mind that the high metal temperatures up to 2000° which can be tolerated for short time use of turbo superchargers. Cannot be applied to land machines. This is the best comprehensive article on the supercharger turbine.

Transactions of the ASME, pp. 287-298, May 1942. Turbines for Power Generation from Industrial-Process Gases by John Goldsbury and J. H. Henderson of G. E. Company. This paper is directed principally at the flue gas turbine used with the catalytic refining operations. Includes some phenomenic data but is subject to question owing to the limited information of certain specific heat data at the time this article was published. This is one of the first articles which suggests that natural gas offers a large potential field for power production through field expansion turbines. Some of these have been built for use without burning the gas.

Steel, pp. 116-122, etc., Aug. 13, 1945. Gas Turbine. Describes the development and design of the 2500 HP oil fired turbine for navy use. Shows photographs of interior and exterior of the unit.

Electrical World, pp. 83-85, Oct. 28, 1944. Potentialities, Limitations of the Combustion Gas Turbine-I by Glenn B. Warren, G. E. Company. Short descriptive article pointing out limiting factors and the problems of starting control and light load operation of gas turbines presumably operated with oil.

Electrical World, pp. 52-55, April 29, 1944. Combustion Gas Turbine a Promising Prime Mover by S. K. Fischer and C. A. Meyer of Westinghouse Electric. Description of a closed cycle system developed by Westinghouse. This requires a separate gas turbine and compressor to pump up the cycle on which the main turbine and compressor operate. This makes for small main engine units. The authors conceive of this unit primarily for locomotives, short drives and large power plants but indicate that the success depends upon the availability of high temperature metals.

National Petroleum News, pp. R308-R313, May 3, 1944. An expanded version of the previous article.

Inco Magazine, Winter Ed. 1945-1946. The Gas Turbine—New Magic from an Old Idea. Description of the Elliott marine turbine in the International Nickel Company whose organization emphasizes the metallurgical aspects and shows a schematic chart giving details of the alloys required for various parts of the turbine system.

Transactions of the Society of Naval Architects and Marine Engineers, 1943. The Gas Turbine as a Possible Marine Prime Mover by C. Richard Soderberg, and Ronald B. Smith. One of the most important recent papers because it precipitated widespread discussion and interest. The paper itself discusses the principal thermodynamic aspects of various turbine cycles and in the second part goes into the mechanical aspects of gas turbines with particular reference to marine application. Since this time the Elliott Company has proceeded with the construction of a marine turbine along the lines which this paper proposed.

FUTURE OF NUCLEAR POWER

(Continued from page 158)

tion and the removal of uranium or other working material before and after irradiation. These structural problems not only can be solved, but they have been solved at the Columbia River plants, and in a very satisfactory way.

However, the required shielding weighs a great deal. Even for a unit generating as little as 100 kilowatts the shielding has a thickness of a number of feet and weighs of the order of magnitude of 50 tons. Unfortunately there is no trick at our disposal to overcome this difficulty. The principles of shielding are very simple and straightforward. What counts is essentially the product of the thickness and the density of the protective material. This circumstance means that even with the densest practical materials there is a minimum required thickness for the shield.

Atomic power appears to be quite out of the picture for automobiles. The same conclusion applies also to airplanes, at least until their weight-carrying capacity reaches ten to a hundred times its present figure. On the other hand, it is quite in order to count on nuclear energy for driving ships, or for running a stationary electric power plant. In neither application does a heavy shield cause too much difficulty. And fortunately, the required weight of the protective material does not increase greatly with power level.

Some emission of radiations continues even after the chain reaction is brought to a halt. Some of the products of nuclear fission, elements of medium atomic weight, are radioactive when formed. These active materials are present in the irradiated uranium which is discharged from the Columbia River piles, and therefore in the uranium which is received by the chemical separation plant at Hanford. What is true of this separation plant will be true of the chemical plant associated with all future piles: shielding is indispensible.

The moral to be drawn from this discussion is that an atomic power unit is not a little gadget that you screw to the handlebar of a bicycle, but that it really involves a sizeable industrial development. The magnitude of even a single plant is necessarily so great, that it may possibly not be economically feasible unless it is designed to produce at least as much as perhaps 100,000 kilowatts of power.

There is little doubt that the thing can be done. Independent estimates agree that in a period of 3 to 30 years depending upon the effort applied, it should be possible to produce atomic energy to compete with coal at twenty dollars a ton, and later on at a substantially lower figure.

"Winfluence"

● It's a public relations director's job to "winfluence" people.—Byron Tefft in Printer's Ink, October 26, 1945.

Laboratories

GEORGE E. WHITWELL, Chairman

R. M. CONNER, Director

Pilot Design Study Initiated

INITIATION of a fundamental domestic gas research investigation into pilot design, construction, and performance has been undertaken for the Committee on Domestic Gas Research by the American Gas Association Testing Laboratories. Detailed supervision will be followed by the Technical Advisory Group for Burners, Controls and Accessories of which Dr. Wm. R. Hainsworth is chairman.

A literature study and engineering survey of contemporary pilots has been completed by the research staff of the West Coast Laboratories. Experimental work on design is now under way. Pilot burner temperatures are also being analyzed in representative types of water heaters, furnaces, and unvented circulators in laying the groundwork for experimental phases of the investigation. A companion study in design methods of preventing closure of pilot primary air openings by dust and lint is under way at the Cleveland Laboratories.

Conference Delegates Visit Laboratories

THE record-breaking attendance of 293 registered delegates to the Domestic Gas Research Technical Conference in Cleveland likewise resulted in a record number of visitors at the A. G. A. Laboratories where they took advantage of the opportunity of inspecting testing and research facilities and conferring with staff members.

Approximately fifty visitors were shown through the Laboratories following the conference, representing manufacturers and utilities from New England to Texas as well as Canada. Visitors included C. E. Blome of Purdue University and H. F. Knoy of the Institute of Gas Technology, both of whom appeared on the conference program.

Other visitors in recent months have included Michael Ferier of Brussels, representing the Imperial Continental Gas Association; W. J. Marley of the Building Research Board of London who is returning to England from an assignment here in connection with atomic research; Otto Jensen, consulting engineer of Oslo, Norway; and Messrs. Chalot and Van Goethem of the French gas appliance manufacturing industry.

Determining Calorific Value of Gases

A SUBGROUP of Committee D-3 on Gaseous Fuels of the American Society for Testing Materials has completed a tentative method of test for calorific value of gaseous fuels by the water-flow calorimeter. Suggestions from its members on a proposed draft were reviewed at a meeting recently held in Pittsburgh and agreement reached on the points involved. The new method is expected to be in readiness for submission to the Society for formal adoption at its June meeting.

Organized for the purpose of preparing standard test methods for use in connection with purchase and sale of gaseous fuels, Committee D-3 is composed of representatives of producers and manufacturers of such products together with those of general interests. It is under the chairmanship of Dr. A. W. Gauger, director, Mineral Industries Research of The Pennsylvania State College. R. M. Conner, director of the American Gas Association Testing Laboratories, is secretary. Reporting to this committee are seven subgroups, each having a definite assignment covering standard methods and procedures applying to gaseous fuels. These include such important details as specific gravity measurement, calorific value, moisture content and others.

The subcommittee responsible for the new test method is under the chairmanship of R. S. Jessup of the National Bureau of Standards who succeeded the late R. B. Harper of The Peoples Gas Light & Coke Company. Together they are principally responsible for the development of the new method which is expected to prove of great value to the gas industry.

Meetings of Committee D-3 and three of its other subgroups were also held in Pittsburgh. They were attended by the Laboratories' director, assistant director and chief engineer.

New Requirements Published

THE American Gas Association Testing Laboratories have published a number of new requirements for appliance approval which become effective January 1, 1947.

Major additions consist of special requirements for high altitude performance of ranges, water heaters, space heaters, and central heating equipment. Separate addenda have been published to the regular requirements for the first three mentioned while the entire central heating text has been republished in a tenth edition including high altitude requirements as well as requirements for gas-fired humidifiers, presented for the first time. Also published is the first edition of new listing requirements for low water cutoff devices.

The new high altitude requirements cover altitudes above 2,000 feet and will benefit approximately 1,200,000 people living in the Rocky Mountain area, according to statistics of the American Gas Association. They cover gas equipment operating on all gases including liquefied petroleum and butane-air. Tests are conducted at low altitude with main and pilot burners over-rated to simulate high altitude operating conditions, thus making it possible for manufacturers to conduct their own preliminary tests. The Laboratories are prepared to test appliances under the new requirements at the present time.

Returning Servicemen

NAVY Lieutenants Frank Fiedler and Walter J. Gay of the American Gas Association Testing Laboratories have been released from active duty and have returned to the Laboratories' staff, bringing the total number of returned servicemen to twelve. Both are employed at the Pacific Coast Branch.

Lt. Fiedler served as electronics officer for the flight squadron of the aircraft carrier Bismarck Sea and survived its sinking with the loss of 350 lives during the invasion of Iwo Jima.

Lt. Gay served in both the Atlantic and Pacific aboard attack transports and was Engineering Officer aboard the USS McCracken. Both entered the Navy in 1942 as apprentice seamen and achieved the rank of Lieutenant Senior Grade.

Mixed Gas Research Bulletin Available

ANNOUNCEMENT has been made by W. R. Fraser, chairman of the Mixed Gas Research Committee, of the publication of Research Bulletin No. 36 entitled "Interchangeability of Other Fuel Gases with Natural Gases." It covers results of experimental work at the A. G. A. Testing Laboratories at Cleveland directed by a joint committee of the Natural Gas Department and the Technical Section, appointed in 1943 under the chairmanship of the late Henry O. Loebell.

This bulletin presents data covering the performance of appliances initially adjusted on natural gases when various kinds of supplemental gas mixtures of heating values greater than 800 B.t.u. are employed. Effects of such substitution are considered for three separate adjustment gases which are representative of all natural fuel gases distributed in the United States.

Derivation and application of mathematical equations for establishing interchangeability limits for lifting, flash-back, and yellow tips with natural gas employed as the adjustment gas, are outlined. Gas interchangeability calculation sheets are given in complete form to provide operators with a quick and ready means of obtaining the interchangeability factors.

In addition, data obtained from a study of flame characteristic test burners are evaluated and steps taken toward development of a burner to provide a visual means of maintaining desired characteristics in gas send-out are outlined.

Copies of the bulletin are available at $2.50 per copy from American Gas Association Testing Laboratories, 1032 East 62nd St., Cleveland 14, Ohio or American Gas Association, 420 Lexington Ave., New York 17, N. Y.

Personal and Otherwise

Hoenigmann Named By Florence Stove Co.

F. J. Hoenigmann

F. J. HOENIGMANN, who resigned recently as executive vice-president and general manager of Cribben and Sexton Co., Chicago, has been elected executive vice-president of Florence Stove Company.

Mr. Hoenigmann is chairman of the Domestic Gas Range Division and a director of the Gas Appliance Manufacturers Association.

He joined Cribben and Sexton in 1930 as sales manager and was elected vice-president in 1940. Previously, he had been general superintendent and works manager of the Moline Plow Co., Moline, Ill. He is a graduate of the University of California.

To Manage Glenwood Industrial Relations

Lt. Col. Winchester

MALCOLM LEACH, president of the Glenwood Range Company, Taunton, Mass., has announced the appointment of Lt. Colonel Frederick E. Winchester, Army labor relations specialist, as manager of industrial relations for the company.

Colonel Winchester, now on terminal leave, served with the U. S. Army as labor relations officer for the New England Division Engineers from May 1942 to December 1944, during which time one of the largest construction programs in New England was completed.

Colonel Winchester lives in Roslindale, Mass. where from 1926 to 1938 he owned and operated a building construction company.

Allen and Amberg Elected Vice-Presidents

C. L. CAMPBELL, president of The Connecticut Light and Power Company, announced March 21 that Charles J. Allen and Emil J. Amberg have been elected vice-presidents of the company by the board of directors. Both men are located in Waterbury and prior to their advancements yesterday, Mr. Allen served as the company's director of public relations and Mr. Amberg as research engineer.

Mr. Allen has been with the power company since 1917. He began as office manager and became auditor, executive assistant, assistant secretary and assistant treasurer. In 1929 he was made manager of the company's Waterbury district, a position he held until 1939 when he was appointed to the newly created position of director of public relations. Mr. Allen's departmental responsibilities include customer relations, advertising, publicity, employee relations and welfare, personnel and claims for injuries and damage.

Bryant Executive Heads New O.P.A. Division

Gordon Rieley

GORDON RIELEY, vice-president of Bryant Heater Company, has been appointed director of the newly established building and construction price division of the Office of Price Administration, and is on leave of absence to assume his new duties immediately, it is announced by Lyle C. Harvey, president of the company.

The new division, which is being formed in part from the building materials division of O.P.A.'s industrial materials division which formerly had jurisdiction over prices in the construction field, will work to assure maximum and expedient cooperation with the National Housing programs by especial concentration on bottleneck and price supply programs. The division will work through three branches, the building materials branch, the prefabricated and mechanical building equipment branch, and the area pricing and distribution branch, to handle the pricing of most building materials, prefabricated equipment and mechanical units.

Mr. Rieley has been associated with Bryant for the past twelve years, where he has specialized in market research and analytical phases of Bryant sales and production. Prior to his association with the company, he was a market analyst and sales consultant. A native of Cleveland, he is chairman of the house heating division of the Gas Appliance Manufacturers Association, and a member of O.P.A.'s gas furnace industry advisory committee, as well as being active in several housing and construction committees of the Cleveland Chamber of Commerce.

Dr. Martin Joins Staff of Portland Gas

Dr. S. W. Martin

DR. S. W. MARTIN, research chemist who headed the chemical section of the Institute of Gas Technology, Chicago, since 1942, has been added to the technical staff of Portland Gas & Coke Company to serve as assistant vice-president in charge of new products development, it is announced by President Paul B. McKee.

An honor graduate of Williams College and Yale University, Dr. Martin was a research physical chemist with the National Lead Company for seven years before going to the Institute, which is affiliated with the Armour Institute.

"Dr. Martin is an outstanding man in his field," said Mr. McKee in announcing the appointment. "We are fortunate to be able to bring him to Portland to aid in carrying forward the industrial research program which has made such notable progress under E. L. Hall, our chief engineer, and his associates."

Included in the long list of products now being recovered by the company in its petroleum processing operations are benzol, xylol, toluol, tar road-binders, electrode pitch, high grade petroleum coke, carbon briquets, and pure carbon.

Bolte Wins High Army Award

ASSISTANT Vice-President Walter E. Bolte of The Brooklyn Union Gas Company has received the War Department's Commendation for Exceptional Civilian Service, highest award the Army can give to a civilian, for his services during the war as chief of the Fuel and Heating Unit in the Office of the Chief of Engineers.

The citation accompanying the award, which was signed by Robert P. Patterson, Secretary of War, states that it was for "exceptional achievement in the development of administrative procedures and techniques in the fuel conservation program, resulting in appreciable savings in this commodity during a critical national shortage."

The citation adds: "His initiative and keen judgment in the administration of this activity for the Office of the Chief of Engineers contributed substantially to the war effort."

Winn Vice-Presidnt of Honolulu Co.

J. J. Winn

EFFECTIVE March 1, J. J. Winn, Jr. was appointed vice-president and general manager of the Honolulu Gas Company. Mr. Winn recently returned to civil life after a three-year period as a procurement officer of the Army Engineer Corps. He spent a large part of his army duty in England and received a Bronze Star for his efficient work in getting supplies across to support the invasion of Normandy. He retired as a Lieutenant Colonel.

Before entering the army Mr. Winn was commercial manager of the Portland (Oregon) Gas and Coke Company. He is also well known in the East, having served in executive capacities in the sales departments of several New England gas companies and in Baltimore.

In the Honolulu Gas Company Mr. Winn replaces Harold W. Boynton who recently resigned following a change in ownership of the company.

E. E. Black of Honolulu has replaced Alfred L. Castle as president of the company. Among the new directors are H. A. White and Boyd McNaughton, both officers of the Hawaiian Pineapple Company.

Ward Joins Surface

Mark E. Ward

SURFACE Combustion Corp., manufacturer of Janitrol heating equipment, announces the appointment of Mark E. Ward as a design engineer at its Columbus, Ohio plant.

Mr. Ward formerly was with the American Gas Association testing laboratories at Cleveland where he was employed for 10 years in testing, inspection, domestic and requirements gas research and in the war products department. He was graduated from Ohio State University in 1932 with a Bachelor of Engineering Physics degree and received his Master of Science degree in Physics in 1933. He continued his studies at Ohio State for two more years.

Azar Joins Stacey

ALBERT A. AZAR has been appointed assistant sales manager of the Stacey Brothers Gas Construction Company, Cincinnati, one of the Dresser industries.

Prior to being employed by the Girdler Corporation in Louisville, Ky., in the capacity of chief project engineer of the gas processes division, Mr. Azar was connected with the former Western Gas Construction Co. of Fort Wayne, Indiana, which specialized in water gas sets and other gas plant equipment. He was also previously connected with the Bartlett-Hayward division of Koppers Company as chief operating engineer.

A. A. Azar

Mr. Azar will be located at the main plant of Stacey Brothers in Cincinnati.

Home Service Appointments

CAMILLE CALDARA has become home service director for the Hilltop south suburban Pittsburgh territory of The Manufacturers Light & Heat Co. and Eleanor A. Marvin is her successor in the company's Steubenville and East Liverpool area in eastern Ohio.

Miss Caldara goes to the Pittsburgh area after completing seven years of home service activities for the natural gas company in Ohio.

Miss Marvin, the new home service director for the natural gas company in the Steubenville and East Liverpool territory, is a graduate of Mt. Mercy College, Pittsburgh.

Kansas City War Chest Record

T. J. Strickler

UNDER the title "Mission Accomplished," an attractively printed report was published last month commemorating the outstanding record of the Kansas City War Chest Fund, Inc., which operated from 1941-1946 under the presidency of T. J. Strickler, vice-president and general manager of the Kansas City Gas Company and a past president of the American Gas Association.

During the five years of its existence and through its four campaigns, the Kansas City War Chest raised nearly nine million dollars for 75 participating organizations. In the peak year of 1944 the average contribution per capita was $5.45 and $14.50 per subscriber. Approximately 6,000 workers were marshalled under the direction of Mr. Strickler to attain all of the funds objectives.

Southern Gas Association Appoints Suttle as Managing Director

ROBERT R. SUTTLE, a consulting engineer of Austin, Texas, and former advisor to the College of Business Administration of the University of Texas, has been selected by a special committee of the Southern Gas Association to serve as its new managing director, according to an announcement by Frank S. Kelly, Jr., president of the association, and an official of the Arkansas Louisiana Gas Co., Shreveport, Louisiana.

Robert R. Suttle

A native of Illinois, Mr. Suttle is a graduate of University of Texas and holds a Master's Degree from the College of Business Administration. For several years he taught personnel and industrial management on a part-time basis at the University.

During the war he held the rank of Lieutenant in the Navy and served at various points as personnel relations officer and assisted in making several special industrial surveys. He has also had considerable executive experience in industrial and utility management with several organizations. He served at one time as secretary-treasurer of a utility company having extensive gas operations in the Southwest.

Mr. Suttle will open the new Southern Gas Association offices in Dallas as soon as suitable quarters can be obtained. In the meantime he will handle the Association's affairs from his present office in Austin, Texas.

He was formally introduced to the membership of the Southern Gas Association at its 35th annual convention, in Galveston, Texas, March 21 and 22. The Southern Gas Association membership includes the 13 southern states and is one of the oldest organizations of its kind in the country.

CATALYTIC GASIFICATION

(Continued from page 164)

if air is used in the process, to mixtures of blue gas and producer gas. The investigations of other industries, which have used this process for the production of hydrogen and hydrogen-nitrogen mixtures, have been confirmed in the present work. A commercial unit developed for the production of special furnace atmospheres has been ordered from the Surface Combustion Company and will be operated as a pilot plant. Delivery of the unit was expected during March, 1946.

The suggestions and advice of Edwin L. Hall, secretary-coordinator of the Gas Production Research Committee, and of Leon J. Willien, acting director of the Institute of Gas Technology, are gratefully acknowledged. The work is part of the research program sponsored by the Gas Production Research Committee of the American Gas Association.

REFORMING HYDROCARBON GASES IN WATER GAS SETS

Title	*Author*	*Pages (Inc.)*	*Year*
	A.G.A. Proceedings 1929–1944		
Report of Subcommittee on Low-Gravity Water Gas	Edwin L. Hall	1216–1218	1929
The Cracking of Heavy Oils and Tars	Dr. Gustav Egloff	1369–1388	1930
Bibliography-Oil Cracking for Gas Making	The Peoples Gas Light & Coke Co.	1388–1465	"
Report of Subcommittee on Reforming of Refinery and Natural Gases	Edwin L. Hall	1465–1466	"
The Refinery Gas Reforming Plant at Chester, Pa.	R. G. Rincliffe	1471–1481	"
Report of the General Oil Gas Corporation, 24 Broad Street, New York		1482–1488	"
Cracking Natural Gas	J. F. Duesler	1488–1490	"
Report on Purification of Refinery Oil Gas	R. G. Rincliffe	1053–1056	1931
Report of Subcommittee on Improved Utilization of Gas Oils	J. G. O'Keeffe	1146–1149	"
The U.G.I. Reforming Process with Refinery Oil Gas and with Natural Gas	H. G. Terzian	1167–1171	"
The Refractory Screen Oil Gas Process	Alfred Johnson	892–893	1932
Report of United Engineers & Constructors Inc.	C. A. Schlegel	916–917	"
Water Gas Manufacture	Lloyd Logan	991–992	"
Report of the Western Gas Construction Co.	Malcolm H. Merritt	824–825 (reforming)	1933
Production of Reformed Natural Gas at the Chicago By-Product Coke Company	H. J. Wiedenbeck	924–928	1934
Gas Analyses in the Study of Water Gas Operations	Leon J. Willien	966–978	"
Economics of Oil Refining by the Gas Industry	D. W. Wilson	759–769	1935
Report of The Gas Machinery Company, Cleveland, Ohio	W. E. Steinwedell	821–822	"
Method of Determining the Relation of Generator Fuel, Oil and Tar in the Evaluation of Heavy Oil for Carburetted Water Gas	H. G. Terzian	848–860	"
Report of Combustion Utilities Corporation Improved Equipment—Russell Engineering Division, New York, N. Y.	Thomas B. Barclay	592–593	1939
The Determination and Examination of Light Oil in Gas	William L. Glowacki	449–450	1941
Laboratory Cracking Tests on Gas Enriching Oil at Normal and Short Time of Contact	Tests sponsored by the A.G.A. Committee on War Activities	316–330	1943
	Pacific Coast Gas Association Proceedings		
The Reforming of Natural Gas	H. L. Masser	724–736	1924
	American Gas Journal—October 1945		
The Utilization of Hydrocarbon Gases in the Production and Distribution of Manufactured Gas	E. G. Boyer	21–30 concluded on p. 78	
	Gas Age—November 29, 1945		
LP-Gases in Water Gas Production	Kurt Richter	25 & 56	

HEATING MOTORS COURTS BY GAS

(Continued from page 155)

tion, caulking, weather stripping and insulation. It is an argument for positive ventilation. Far too often it has been thought that loose fitting windows and doors would permit entrance of enough air for fuel combustion and requirements of the occupants. Then a freezing rain sealed those cracks and asphyxiation or suffocation was the result. Every unit of the court should have provision for positive ventilation by means of grills placed in floors or ceilings or stud spaces with plates cut at top or bottom of stud space to permit air to flow into the room.

Reviewing this discussion it might be taken as a brief against the use of gas. It is an appeal to stop the abuse of gas. History is full of records of the treachery of abused servants. Properly used, gas is a faithful, efficient, willing servant. Abuse this servant and you can expect it to strike back. The engineers of the gas industry and the gas appliance manufacturers are constantly working to improve existing appliances and devise new ones. At this very moment tests are being prepared for an appliance which should be the solution to your heating problem. Briefly described this is either a console-type circulator or panel heater for installation in an outside wall with provision made for supply of air for combustion from outside the building and the venting of the products outside the building without using a chimney or flue. Sounds like a miracle, doesn't it? It is no more fantastic than refrigeration and summer air-conditioning from a gas flame or any one of the seeming miracles which have been performed by gas in industrial applications for prosecution of the war.

To summarize, we offer ten points for your guidance and consideration when installing and using gas-fired heating equipment for motor courts.

1. Consult your gas company engineers. They are anxious to help you.
2. Purchase A. G. A.-approved equipment with capacity to do the job.
3. Use nothing but full-vented equipment.
4. Have all gas piping installed by competent licensed workmen.
5. Install venting in accordance with National Board of Fire Underwriters requirements.

6. Provide positive ventilation for each motor court unit.

7. Check flues and vents every year before using heating equipment to see that no birds' nests or other debris has accumulated therein.

8. If you find that flues are subject to backdrafts install caps designed by reputable manufacturers to prevent this condition.

9. Call your gas company service department to check burner adjustments every fall before heating season starts.

10. Work with all trade organizations to see that sane regulations covering the use of gas in motor courts be passed and enforced.

Safety Regulations

The subject of regulations is a touchy one. We all feel that we are being regulated ad infinitum, ad nauseum. However, the regulations we have in mind will not require most people to do any more than they are already doing. They will, however, require the recalcitrant minority to raise their standards. A great many states do not have any rules whatever covering the use of gas in motor courts. Following is a copy of The State of California, Health and Safety Code (Sec. 18470):

"18470. Every gas water heater, and every other gas-fire appliance used for the purpose of heating a building, except gas plates and gas ranges, in every auto court and resort apartment shall be effectively vented so as to discharge at least 90 per cent of the flue gases therefrom through a sheet metal or other approved vent pipe not less than the area of the vent outlet on the appliance but in no case less than three inches in internal diameter, which vent pipe shall be connected to a vertical, or substantially vertical flue or chimney leading to the outer air above the roof. The flue or chimney shall be either terra cotta, brick, fire clay, or other approved product, having a wall thickness of adequate insulating value, and which will not disintegrate from the effects of the products of combustion. The internal area of the flue or chimney shall be at least 12 square inches.

"All gas appliances subject to the provisions of this section and all gas plates and gas ranges shall be rigidly connected with metal piping directly to the gas service inlet."

Surely this a sane regulation which should be in effect everywhere. The motor court industry has had a long hard fight to obtain its present status of dignity and stability. Every time an asphyxiation or suffocation occurs in some ratty tourist camp and especially when, as is too often the case, an ugly scandal accompanies the incident, the entire motor court industry suffers. It certainly is no credit to the gas industry or state health departments either. Let's all get together and clean up this mess. In doing so we will save many lives. This is not a Boy Scout activity. It is just plain good business.

Sun Oil Starts Program To Conserve Natural Gas

A $4,000,000 program to conserve natural gas, including the construction of nine processing plants in Texas, Louisiana and Michigan, was announced March 11 by James E. Pew, manager of the natural gas and natural gasoline division of Sun Oil Co.

More than 65,000,000 cubic feet of gas daily will be saved under the program, Mr. Pew said, adding that construction of the plants would be started immediately.

Coal Utilization Research Expands

DIRECTORS of Bituminous Coal Research, Inc., national research agency for the bituminous coal industry, last month approved a current budget that calls for investing $401,000 in more than 40 research projects intended to improve utilization of solid fuels by railroads, industry and domestic consumers.

More than one-half of the current budget covers projects under way and to be started this year at Battelle Memorial Institute, Columbus, Ohio. The directors reported that 26 projects had been allocated to Battelle, including fully automatic stokers, smokeless stoves, furnaces, ranges and water heaters, group heating, and chimney design and construction, all in the residential heating field; railroad coal uses, such as air supply, overfire steam-air jets, effect of fuel on locomotive performance, and handling railroad coal; industrial steam and non-steam uses, gasification of coal, and coal drying and preparation.

It was also announced that B. C. R. is a major contributor to the Coal Research Laboratory of Carnegie Institute of Technology, Pittsburgh, where basic research is under way on combustion and gasification processes, heat transfer into coal during carbonization and combustion, coke quality, and the production of chemicals by hydrogenating coal.

Reads Million Meters Without Error

GEORGE P. WOLL, a meter reader employed by The Brooklyn Union Gas Company, was acclaimed by his company recently as the world's champion no-error meter reader.

Mr. Woll won the title when on February 26 he took his millionth consecutive perfect reading.

Committee Calendar

APRIL

1 •Customer Activities Group Meeting, Netherland Plaza Hotel, Cincinnati, Ohio—J. W. Roper, Chairman

4 •Technical Advisory Group for Burners, Controls and Accessories Research, A. G. A. Headquarters, New York, N. Y.—Dr. Wm. R. Hainsworth, Chairman

9 •Technical Advisory Group for Domestic Gas Water Heating Research, Hotel Statler, Cleveland, Ohio—L. R. Mendelson, Chairman

10 •Technical Advisory Group for Central Gas Space Heating Research, Hotel Statler, Cleveland, Ohio—Keith T. Davis, Chairman

11 •Technical Advisory Group for Domestic Gas Cooking Research, Hotel Statler, Cleveland, Ohio—Charles M. Mayer, Chairman

12 •Home Service Committee, A. G. A. Headquarters, New York, N. Y.—Mrs. Lillian P. Dunbar, Chairman

MAY

2 •Committee on Domestic Gas Research, A. G. A. Headquarters, New York, N. Y.—F. M. Banks, Chairman

2 •Managing Committee, Industrial and Commercial Gas Section, Hotel Claridge, Atlantic City, N. J.—H. A. Sutton, Chairman

5 •Committee on National Advertising, Hotel Gibson, Cincinnati, Ohio—D. P. Hartson, Chairman

6 •American Gas Association Executive Board, Cincinnati, Ohio—Everett J. Boothby, Chairman

6 •Technical and Research Committee, Natural Gas Dept., Hotel Gibson, Cincinnati, Ohio—H. D. Hancock, Chairman

7 •Natural Gas Dept. Managing and Advisory Committees, Hotel Gibson, Cincinnati, Ohio—R. H. Hargrove, Chairman

7-8 •Committee on National Advertising and Subcommittee on Copy, Hotel Gibson, Cincinnati, Ohio—D. P. Hartson, Chairman; J. J. Quinn, Chairman

Utility Gas Sales in January

JANUARY sales of the gas utility industry totaled 2,734,076,000 therms, an increase of 0.1 per cent compared with sales in January 1945, the American Gas Association statistical bureau announced last month. The Association's new index number of gas utility sales stood at 189.9 for January (1935-1939 = 100.0).

Sales for the 12-month period ending January 31, 1946, were about 25,287,149,600 therms, unchanged from the comparable period a year ago.

Sales of manufactured and mixed gas in January were 309,193,400 therms, equivalent to an increase of 1.4 per cent over January 1945. The index of manufactured and mixed gas sales was at 177.7 for January (1935-1939 = 100.0).

Manufactured and mixed gas sales in the 12 months ending January 31, 1946 increased 1.9 per cent over the same period ending in 1945 totalling 2,960,845,200 therms in the current period.

Natural gas sales decreased 0.1 per cent in January, falling from 2,426,938,800 therms a year ago to 2,424,882,600 this year. The Association's natural gas sales index, however, was 191.5 for January (1935-1939 = 100.0).

Natural gas sales approximated 22,326,304,400 therms in the 12 months ending January 31, 1946, a decrease of 0.3 per cent compared with the same period ending last year.

A therm is a unit measurement of gas supply which takes into account variations in heating value. One therm is roughly equivalent on the average to 170 cubic feet of manufactured and mixed gas, or to 100 cubic feet of natural gas.

Obituary

W. G. VINCENT, vice-president and executive engineer of Pacific Gas and Electric Company—a veteran with almost thirty-four years of utility service—passed away January 29 after an illness of several weeks.

Mr. Vincent was born in New Orleans, Louisiana, on August 11, 1882. He was graduated from Tulane University in 1902 in mechanical engineering and from Cornell University in 1904 in electrical engineering. In the fall of 1904 he went to San Francisco and in 1906 became assistant electrical engineer of the Ocean Shore Railroad Company. After a year in that capacity he entered the employ of Professor C. L. Cory, who, besides being on the faculty of the department of electrical engineering at the University of California, also was a consulting engineer with offices in San Francisco.

In 1911 Mr. Vincent took a position with the J. G. White Engineering Corporation, then engaged in making a valuation of the properties of the P. G. and E. On May 1, 1912, upon completion of that task, he joined the staff of the P. G. and E. as valuation engineer. Eight years later he was advanced to the post of executive engineer and in 1922 was made a vice-president, in charge of five departments—valuation, rates, land, statistical and natural gas purchases. He wrote numerous articles on engineering subjects and was nationally known in utility circles.

Mr. Vincent was vice-president and a director of the Standard Pacific Gas Line, Incorporated, past president of the Engineers Club of San Francisco and an associate member of the American Institute of Electrical Engineers.

Surviving Mr. Vincent are his widow and two daughters, Mrs. Linda M. Barnes of New York and Mrs. Thomas B. Curran of Bakersfield.

WARREN D. STEWART, industrial engineer of Stone & Webster Engineering Corporation, died of pneumonia on January 28, at his home in Wollaston, Massachusetts. He was born October 29, 1891.

Mr. Stewart entered the employ of the Lynn Gas & Electric Co. as assistant chemist in 1909 and of Lowell Gas Light Company in 1914, as chemist, and in subsequent years served as chemist for Pawtucket Gas Company, as gas works superintendent at Fall River Gas Works, and as general superintendent of the gas department of the Western United Gas and Electric Company.

In 1926, he accepted a position as engineer in the Boston office of Stone & Webster. Since that time he has been engaged in the design of many gas and industrial plants. Mr. Stewart was an authority on the production of ammonia, phosphorous and high explosives, including TNT, tetryl and lead azide.

At the time of his death and for three years prior thereto, he acted as assistant project engineer of the Stone & Webster atom bomb group, and directed the activities of the engineering group in the Boston office. He had the gratification of knowing that his efforts contributed materially to the ending of the war.

Mr. Stewart leaves a widow, Mrs. Bessie Stewart, two sons, Warren D., Jr. and Allen and two daughters, Mrs. Margery Barton and Mrs. Ruth Kimball.

He was a member of the American Chemical Society, American Society of Mechanical Engineers, American Gas Association and New England Gas Association.

Personnel Service

SERVICES OFFERED

Fuel and **Combustion Engineer.** At present a Commander in the Navy available June. Five years in manufacture of gas and coke by-products. Two years with nationally known testing and research laboratories. Five years teaching college chemistry. One year teaching electricity, radio and electronics. Proven ability to handle men. **1514.**

Engineer with wide experience in production and distribution of natural and manufactured gas, management of electric, gas and water utilities, rehabilitation of properties, appliance work and wide contacts with industrial customers and their problems, desires connection with progressive utility. Employed but available on fairly short notice. **1515.**

Manager of **Operations** and **Labor Relations,** wide experience in all phases of gas industry, design, construction, operation and labor management issues. **1516.**

20 years' experience as **Executive** and **Division Manager.** Received training by serving apprenticeship in every department of large Southern gas plant. Thorough knowledge all phases construction, maintenance, organizing sales campaigns, training collectors and general operations—water gas—coal gas—butane—natural gas. Married—two children. Military Prep education. 42. **1517.**

Superintendent, General Superintendent or **Manager,** 20 years' experience in Coal and Water Gas Production, Distribution, Servicing and Merchandising Installations and Erection work. B.S. Degree in Mechanical Engineering. Now employed. **1518.**

Sales and **Personnel** Executive with strong sales and Industrial Relations background. Twenty-five years broad diversified experience. Twenty-two of those years working in the gas industry. Fully qualified to head up sales or personnel department or to act as executive assistant to an officer in charge of such departments. **1519.**

POSITIONS OPEN

Gas Engineers with experience on design of Carburetted Water Gas Plants and Equipment; also two or three **Superintendents** with experience in gas plant construction. **0447.**

Man familiar with general utility accounting and customer billing as **Assistant Controller** for large middle western utility. **0448.**

One of the largest gas companies in the Middle West has an excellent opportunity for a **Mechanical Designer** 30 to 40 years of age with experience in plant layout, power plant equipment and reinforced concrete and steel. This position is not a temporary one and all replies will be treated confidentially. **0450.**

Wanted by gas department of a large Michigan public utility company, **Young Engineering Graduates.** Some chemical engineering training desirable. Interesting opportunities for ambitious young men desiring a future in natural gas production, transmission and distribution. **0451.**

A progressive Mid-Western Gas Utility with less than 150,000 meters has an opening for a capable, promotion-minded **Home Service Director.** This job is not a sinecure, hard work and problems there are aplenty. Neither is it a job that pays a million dollars. But an efficient, experienced, wide-awake home economist will find both conditions and pay satisfactory. Write letter of application, giving full details as to experience, age, salary desired. All replies confidential. Our own people know of this ad. **0452.**

An Eastern gas company offers excellent opportunity to two recent technical graduates as **Cadets** for Production and Distribution respectively. **0453.**

Appliance Sales Manager—Medium sized gas utility in the East requires experienced and aggressive man—40 or under to **direct sales personnel** of the four major gas appliances and new home developments in a rapidly growing territory. Correspondence strictly confidential. Excellent opportunity for advancement. **0454.**

Plant Superintendent for Carburetted Water Gas Plant producing 1000 MCF per day, located in the East. Reply giving full details of Education, Experience and Age. **0455.**

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